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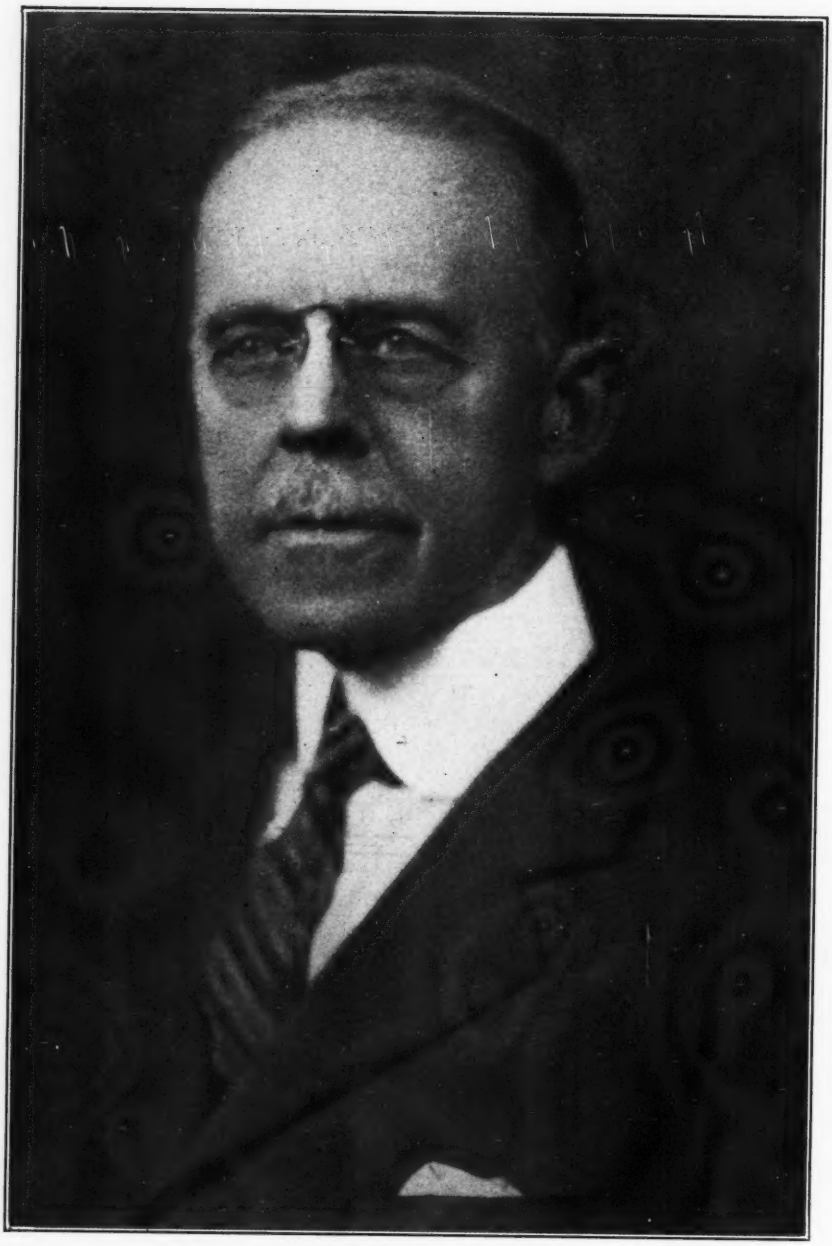

DR. VICTOR HUGO JACKSON
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ORIGINAL ARTICLES

A CLINICAL DEMONSTRATION OF A CHANGE IN THE APICAL BASE WITH CONGENITALLY ABSENT MAXILLARY LATERALS*

BY HENRY C. FERRIS, D.D.S., NEW YORK CITY

THE apical base, or the bony region surrounding the apex of the fully developed roots of the permanent dentition, is theorized to be permanently unalterable by mechanical or physical forces.

Should this theorem be accepted, our field of service as orthodontists would be limited to the movement of teeth during the period of eruption and formation of the roots, if we are to expect permanent retention after they are moved to a new position.

The attitude taken upon this subject on the part of some orthodontists calls for more scientific evidence than a history of two or three failures, before their opinions can be accepted.

The evidence presented, showing a relapsed condition after a period of years, may be proof that the initial movement had not been carried to a point of perfection where a permanent retention may reasonably have been expected. Some of these reports give little, if any, detail as to the amount of force used in the tooth movement, or the method in which it has been applied, or the time taken in accomplishing the result. All of these factors, together with the physical condition of the patient, are vital.

The application of force, both mechanical and physical, to aid nature in overcoming arrested development of the bones of the face and teeth, has yet to be standardized before a reasonable prognosis can be made for a patient in average normal physical condition.

The only safe goal for the orthodontist to try to attain in his operation is a normal occlusion in three dimensions of the thirty-two teeth of the permanent dentition.

*Read before the Dewey Study Club, New York City.

It seems pertinent to here state that the compromising practitioners of orthodontia are growing bolder, by an increasing number of sympathizers, in adopting a short method of correcting malocclusion by extraction. Whether this tendency is influenced by economics, after these operators have failed to attain a desired result, or is a lowering of the standards which have made our calling, is a question yet to be answered.

Many practitioners of orthodontia seem to think that it is a much simpler procedure to close spaces of missing teeth (whether due to congenital or surgical causes) than to establish the normal position of the remaining teeth to a predetermined arch with the spaces of the missing molars open. This is not true in my experience, if the perpendicular axis is considered.

I am confident that radiographic records of the perpendicular axis of the second and third molars, when the first molars have been moved, would show that the apical base of these teeth are seldom changed. The serviceable occlusion attained, which looks ideal, actually weakens the periodontal membrane by abnormal stress of mastication on the anteriorly inclined molars, resulting in a field favoring the liability of pyorrhea infections, and shortening their length of service. The position of these molars when moved anteriorly in a normal perpendicular position materially increases the articular power distributed to the incisor region designed by nature to be borne by the third molar in the region of the muscular attachments.

This simple method may result in a functioning occlusion, but even the best results prove a loss to the patient which cannot be over-stressed. Many orthodontists support this practice with the statement that they lack confidence in the prosthetic restorations necessary to fill the spaces caused by the missing teeth, and they object to ordering young subjects to wear artificial restorations for life. This explanation may be tempered with personal inability to construct these restorations, or lack of confidence in their fellow specialists.

There is just cause for complaint, after years of orthodontic operation, and an ideal result having been attained, when the work is ruined by incompetent prosthesis. These objections are not insurmountable. Prosthetic restorations can, and are being made of permanent value. They are artificial, and their abutments, of necessity, carry added stress in mastication which may not be ideal, but they are practical and serve thousands for life; and in the light of the present-day scientific advance in the study of growth and development of the supporting bones of the teeth, and a fuller appreciation of a full complement of teeth and completed dental arches, they represent the best expedient.

We must pause to consider the scope of our decision before we take the supposed simple course and allow a mechanical occlusion to override a broader appreciation of the influence of a mutilated anatomic development upon all the bones of the face and its accompanying pathologic influences.

The Creator designed the normal position of the teeth to be a part of a composite anatomic structure and a physiologic process of a basic importance; and an interference with this mechanism, based on the standpoint of expediency, may destroy the highest functioning value of the entire physical system.

For instance, the loss of four molar teeth for an individual will result in an increased quantity of undigested starch in the feces.

The loss of four premolars will show an increased quantity of undigested meat fiber in the feces. Any student of pathology is aware of the baneful effects of these products and their sequelae to the chemistry of the blood and its influence upon the excretory organs.

This statement has been proved by an exhaustive research by Prof. A. Michel, Wurzburg, Germany,[1] who reported his results on seventy-five experimental patients over a period of three months, and his findings have never been repudiated.

In the function of mastication, the tongue involuntarily places to those teeth the food they are designed to reduce, and mutilation interferes with this function.

Prof. James C. Brash, of England,[2] has just presented to the scientific world a new thought—that function of mastication is necessary for the growth and development of the bones of the face even though the calcium and phosphorus balance be normal in the blood.

Mutilation, therefore, not only lessens the power to reduce food, but it inhibits the chronologic growth of the bones that carry the teeth, resulting in a shortening of elevator and depressor muscles of the jaws, influencing circulation of the blood to the thyroid and salivary glands; and completely alters the face and personality of the patient.

The removal of teeth during the developmental period and closure of spaces causes a foreshortening of the arches of the teeth. It further proportionally reduces the development of the maxillary bones and the nasal process and dwarfs the nasal space, influencing the patient's power of breathing. The nasal bones, which grow from separate centers, fail to meet their highest potential and are usually deformed, as well as the maxillary sinuses.

In the last three months, Prof. C. J. Connolly, of the Catholic University, Washington, has proved that the orbit of the human closes as it advances in years from birth to maturity, the superior ridges growing down 2.5 mm. and the inferior orbital ridges growing up 1.5 mm. under normal function of a full complement of teeth.

The effects of function upon the rest of the skull have not been proved, but we find unbalance in the conformation of the skull in our unilateral cases of malocclusion. It is universally considered that a full complement of teeth in normal occlusion results in the best beauty for any type.

These statements are accepted and can be proved by hundreds of living examples, and should be sufficient evidence to cause the orthodontic specialists to aim above the serviceable occlusion as their goal.

The treatment of adults by the extraction of teeth may be permissible in exceptional conditions where disharmony of the maxillary and mandibular bones has developed abnormally through years of dysfunction; but I have opened spaces at thirty-four to fifty-five years of age (closed by nature at twenty years) with extremely beneficial results, overcoming traumatic occlusion in the incisor region and greatly improving the facial appearance.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

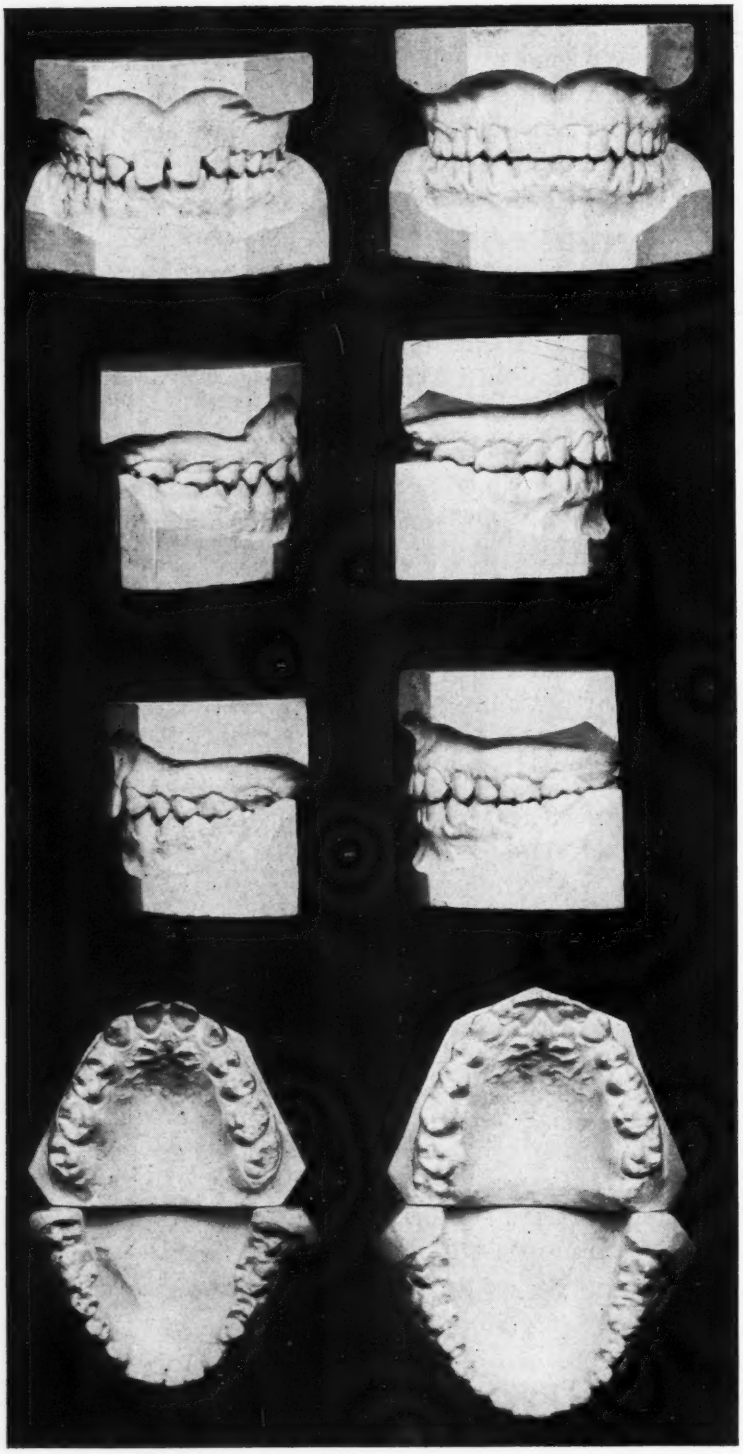

Fig. 1.—Front view, before and after treatment.
Fig. 2.—Side view, before and after treatment.
Fig. 3.—Right side view, before and after treatment.
Fig. 4.—Occlusal view, before and after treatment.

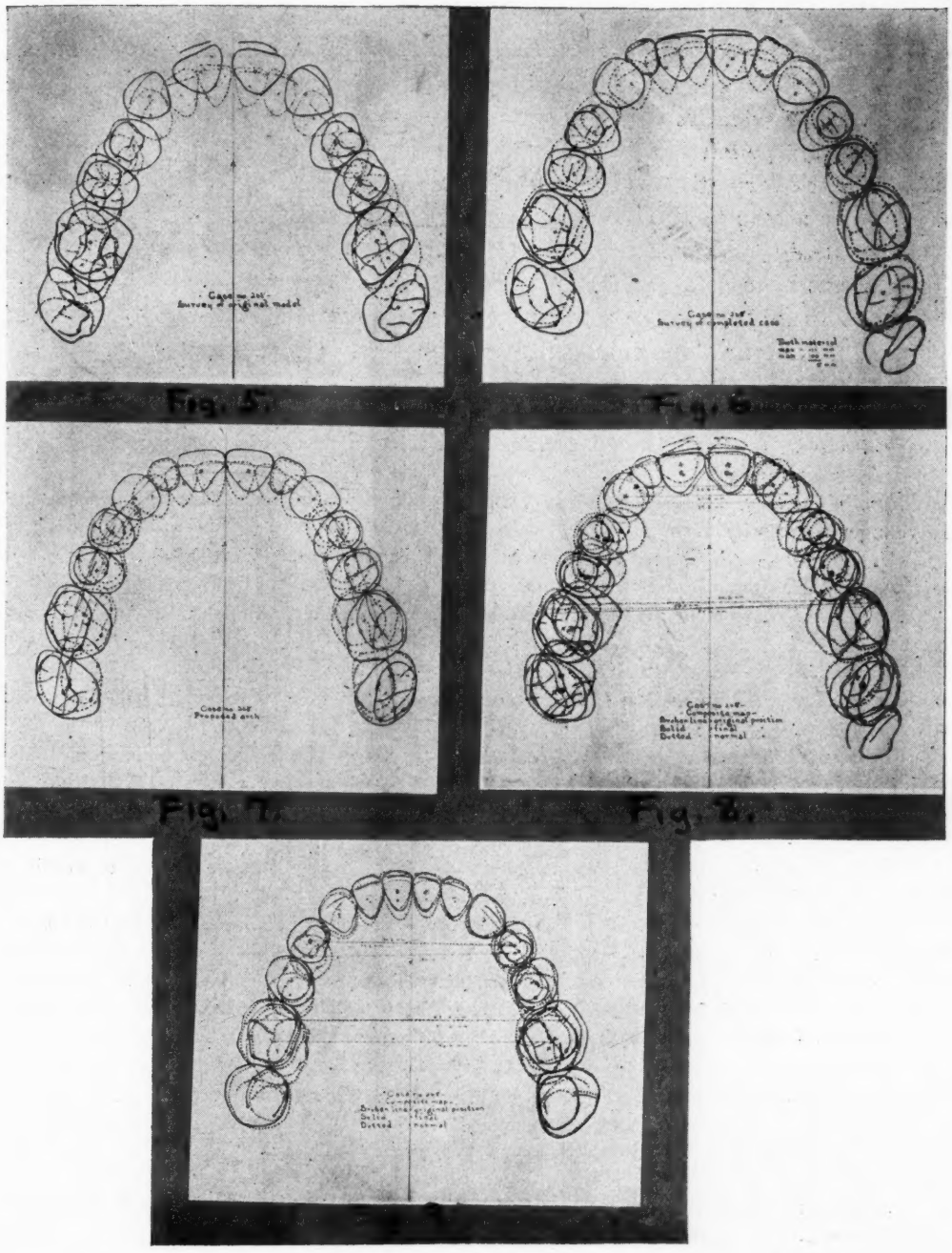

Fig. 5.—Survey of original model shown in Figs. 1, 2, 3, and 4.
Fig. 6.—Survey of completed case of model shown in Figs. 1, 2, 3, and 4.
Fig. 7.—Proposed arch established by survey.
Fig. 8.—Composite map of maxillary arch, original, proposed and completed.
Fig. 9.—Composite map of mandibular arch, original, proposed and completed.

I take pleasure in presenting a case for your review of a patient who was born minus the superior maxillary lateral teeth germs. I selected this case from my practice to demonstrate the possibility of stretching the forces of bone growth. The predetermined arch is larger than nature's architectural plan laid down in the embryo. The lateral incisor spaces were opened to overcome

a deformity of the associated structures, and produce a handsome face. I have changed the apical space of many of the teeth with nature's assistance, and the patient has not had retention for four years other than the replacement of lateral incisors with Carmichael attachments to the canines.

I was compelled to leave the first molars in slight rotation to maintain contact in the formation of the maxillary arches, and the occlusion suffered to a degree as a result; but the general physical development of the patient has been completed, and I am confident that a broader concept of orthodontic possibilities has been attained. I will present the plaster models for your study with photographic records; also an engineering survey before and after treatment, with contour maps enlarged five diameters. (Figs. 1 to 9.)

CASE REPORT

Patient.—D. G., Case No. 268, female. Age, thirteen years. Height, normal. Weight, 15 pounds below normal.

Family History.—Mother, healthy, with full normal occlusion. Father, negative. Has one younger sister with right maxillary lateral missing.

Case History.—No serious or acute infectious disease recorded. Child reared in best environment. Maxillary laterals congenitally absent.

Blood Analysis.—Hemoglobin—89. Wassermann—Negative. Blood Chemistry—Subnormal.

Nerve Reflexes.—Subacute.

Radiographic Record.—Shows absence of maxillary laterals. Four third molars present and impacted.

Orthodontic Treatment.—Survey of maxillary arch established 56 m.m. between buccal grooves of the first molars, height of arch 32 m.m., after supplying width of two laterals, 5 mm. each. The maxillary length of tooth material is 111 mm., and the mandibular length is 106 mm., resulting in a difference of 5 mm.

The formation of an arch was selected, considering these measurements, to result in an occlusion with the least amount of total tooth movement.

Appliance Design.—(Fig. 19.) The first maxillary appliance included the banding of the right and left centrals and canines. Half-round tubes (0.038) on the central bands and round tubes (0.038) on the canines, all parallel on the perpendicular axis. An arch of 0.038 was fitted with 0.038 round pins for canines; 0.038 half-round pins for centrals with "U"-shaped loop bent twice the height for its width, over the lateral incisor spaces. These "U" springs were set for 0.5 mm. expansion, each exerting 0.2 of a pound total pressure. The horizontal section thus deformed, was brought back to its normal position by a bend at the right angle turn. An intermaxillary hook was soldered below the latch on the points of cusps of the canine. This completed the labial apparatus, and was independent of the lingual.

The lingual apparatus was constructed by banding the first premolars and the molars. An 0.038 bar was soldered to the first molar bands in contact with both premolars and the arch was extended in hook form, anterior, and in contact with the canines.

A "U"-shaped power spring of 0.038 wire was constructed, twice the width for the height, fitted with "Murlless" locks, set for 4 mm. expansion, exerting 0.6 of a pound pressure.

Fig. 10.—Patient before treatment.
Fig. 11.—Patient before treatment, left side view.
Fig. 12.—Patient before treatment.
Fig. 13.—Patient after treatment.
Fig. 14.—Patient after treatment, left side view.
Fig. 15.—Patient after treatment.
Fig. 16.—Four years after expansion was completed and artificial teeth inserted.
Fig. 17.—Four years after expansion was completed and artificial teeth inserted, left side view.
Fig. 18.—Four years after expansion was completed and artificial teeth inserted.

Fig. 10. Fig. 11. Fig. 12.

Fig. 13. Fig. 14. Fig. 15.

Fig. 16. Fig. 17. Fig. 18.

The Mandibular Appliance (Fig. 20) consisted of right and left molar bands with a lingual arch (0.038) with semicircular lugs of 0.028 wire soldered to rest distal to the right and left premolars and right and left canines. Molar bands were fitted with buccal hooks. Light elastics exerting 2 ounce pull were adjusted to the hooks primarily to overcome the posterior occlusion, and to exert a backward pull to the maxillary canines. This lingual arch was set for 4 mm. expansion bent on the center.

These appliances were worn two years. The force was increased every three months. At this time the posterior occlusion was reduced, and a lateral expansion was carried 2 mm. beyond the designed position. Photographic and model records were taken at this time.

The Second Maxillary Appliance (Fig. 21) was constructed with molar bands heavily reinforced with buccal hooks. A 0.038 retaining arch was introduced upon which two lateral

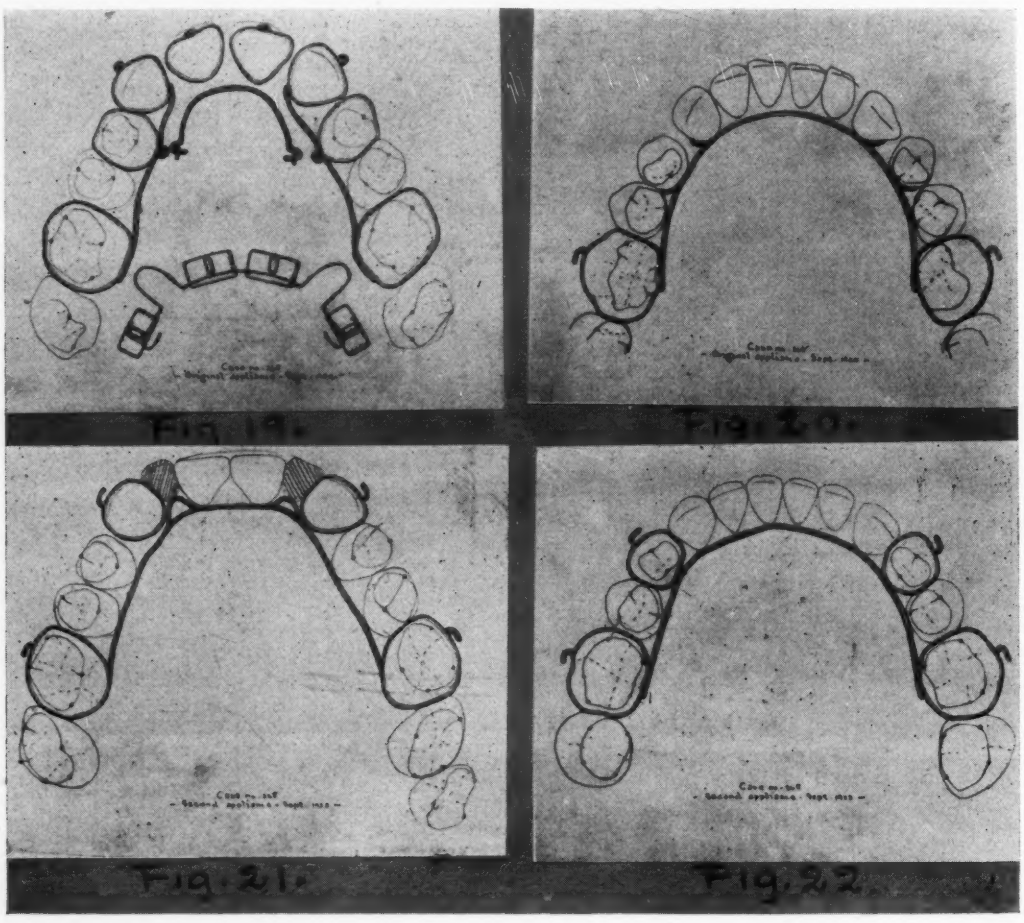

Fig. 19.—Maxillary appliance.
Fig. 20.—Mandibular appliance.
Fig. 21.—Second maxillary appliance.
Fig. 22.—Second mandibular appliance.

facings were soldered. Canine bands with hooks soldered below the tip of the cusps were used, these bands being independent to the lingual arch. Buccal hooks were attached to first molar bands.

The Second Mandibular Lingual Arch (Fig. 22) was constructed with buccal hooks on the first molar and first premolar bands to which light elastics were attached, engaging the maxillary canine hooks. The lingual arch was set neutral. Every three months the elastics were reversed in their action. First from the maxillary canine to the mandibular molar hooks, then from the maxillary molar to the mandibular premolar hooks, to stimulate alveolar bone growth resulting in a total development of both arches as shown in the profile picture and the final eruption of the third molars, definitely demonstrating our ability of overcoming

the impaction of the third molars which are too frequently recommended for surgical removal. Figs. 23 to 30 show x-ray records made by Dr. F. F. Harrower, New York. Figs. 31-32 show the central incisors, before and after treatment, illustrating interstitial and alveolar growth. Figs. 33 and 34 show the right maxillary canine and premolars, before and

Fig. 23. Fig. 24.

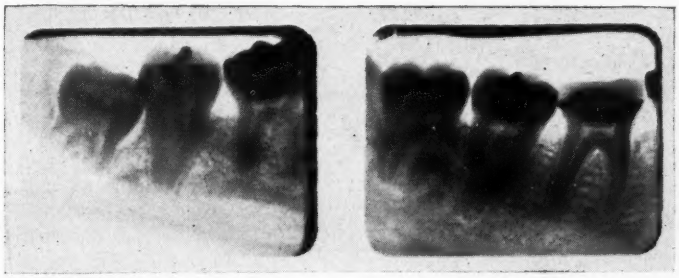

Fig. 25. Fig. 26.

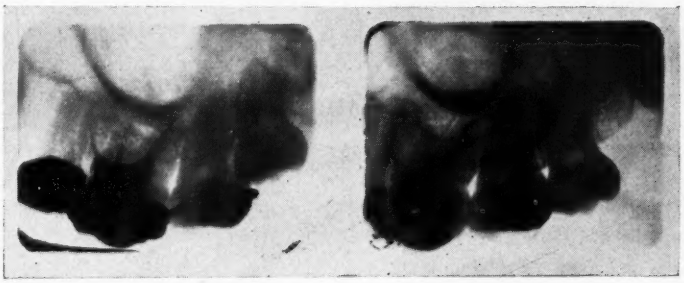

Fig. 27. Fig. 28.

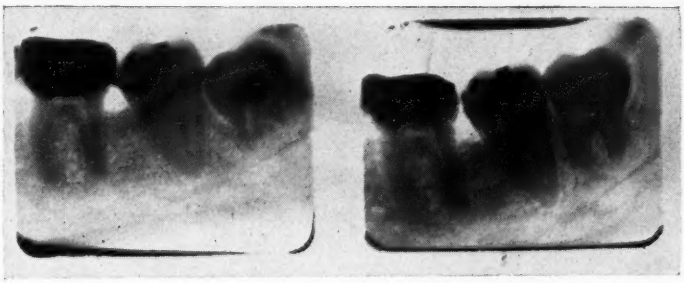

Fig. 29. Fig. 30.

Fig. 23.—Right maxillary view, May, 1926.
Fig. 24.—Right maxillary view, July, 1928.
Fig. 25.—Right mandibular view, May, 1926.
Fig. 26.—Right mandibular view, July, 1928.
Fig. 27.—Left maxillary view, May, 1926.
Fig. 28.—Left maxillary view, July, 1928.
Fig. 29.—Left mandibular view, May, 1926.
Fig. 30.—Left mandibular view, July, 1928.

after treatment, illustrating development of alveolar bone in interstitial spaces. Figs. 35 and 36 show the left maxillary canine and premolars, before and after treatment, illustrating development of alveolar bone in interstitial spaces.

All apparatus was removed and permanent maxillary lateral facings were introduced on Carmichael attachments.

In conclusion, I would leave you with the statement that the orthodontic specialist who deliberately mutilates nature's anatomical plan to correct a

Fig. 31.

Fig. 32.

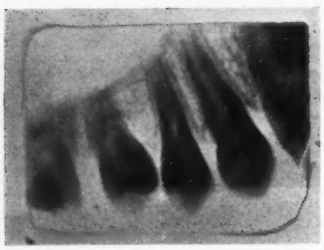

Fig. 33.

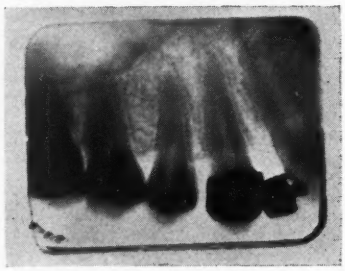

Fig. 34.

Fig. 35.

Fig. 36.

Fig. 31.—Central incisors view, Sept., 1920.
Fig. 32.—Central incisors view, July, 1928.
Fig. 33.—Right maxillary view, Sept., 1920.
Fig. 34.—Right maxillary view, July, 1928.
Fig. 35.—Left maxillary view, Sept., 1920.
Fig. 36.—Left maxillary view, July, 1928.

malocclusion of a growing subject's teeth, without taking the aforesaid facts into consideration, is not giving the best service to his patient, in the light of the science of today.

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2. Brash, Prof. James C.: INTERNAT. J. ORTHO., ORAL SURG. AND RADIOG. 56.

ON UNILATERAL DISTAL OCCLUSION*

By Frederick Lester Stanton, D.D.S., New York City
Professor of Preventive Dentistry, New York University College of Dentistry

UNILATERAL Class 2 cases (Angle) have been considered more difficult to treat than bilateral disto-occlusion cases. This type of case is rarely selected by orthodontists for case reports.

The following three cases have been selected to illustrate diagnosis based on the following points: (1) aim of treatment to establish normal occlusion; (2) orthographic maps of malocclusion with axis of symmetry and denture centroid computed as outlined in previous papers;† (3) map of occlusion constructed on the plan that the arch selected will be the normal arch for the given set of teeth that will require a minimum change; (4) composite diagnostic maps constructed by relating the maps of occlusion and malocclusion so that the sum of squares of movement shall be a minimum.

The following are characteristic of all unilateral distal cases: (1) the mandibular canines and premolars on the side of distal occlusion are farther from the midaxis than the corresponding teeth on the opposite side; (2) the midline of the mandibular arch is always misplaced toward the side of the distal occlusion.

The obvious treatment is first to move the mandibular canine and premolars away from the midaxis on the mesiodistal normal side.

The second step is to move the mandibular incisors toward the normal side, thus correcting the midline and creating space for the side teeth in distal occlusion.

The third step is to move the molar and premolars forward on the distal side.

Intermaxillary elastics are contraindicated until steps one and two are finished.

Case 1.—Map C discloses that the left molars and premolars require a backward movement. The left premolars and canine are nearer the midaxis than the corresponding teeth on the right side. The forward shifting of the molars, premolars and canine has caused a displacement of the incisors.

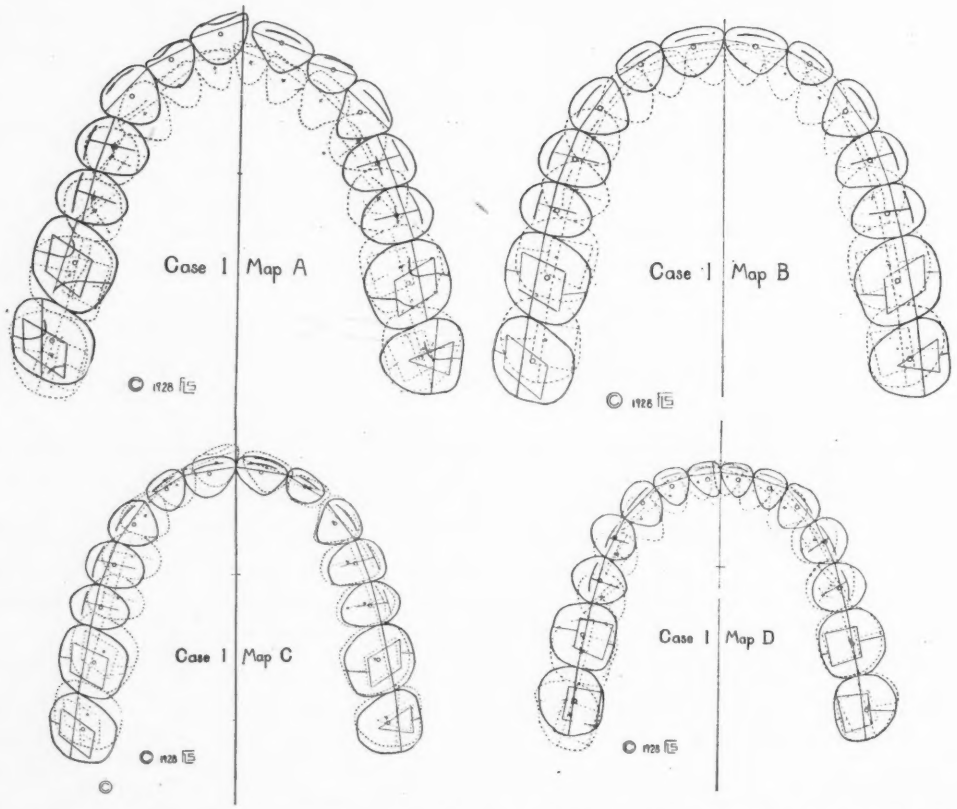
Map D discloses that the right canine and first premolar are nearer the midaxis than the left canine and premolar. The midline has shifted to the left. The left molars need a forward movement equal to the distal movement of the uppers.

*Presented at the meeting of the American Society of Orthodontists, Buffalo, N. Y., April 30-May 2, 1928.

†"Consideration of Normal and Abnormal Dentures as a Problem of Three Dimensional Space and its Bearing on Orthodontic Classification and Terminology." Read before the New York Society of Orthodontists, New York, Feb. 8, 1922.

"Arch Predetermination and a Method of Relating the Predetermined Arch to the Malocclusion, to Show the Minimum Tooth Movement." THE INTERNATIONAL JOURNAL OF ORTHODONTIA, 757, December, 1922.

Fig. 1.—Case 1. Occlusal view, right side, front view, left side.



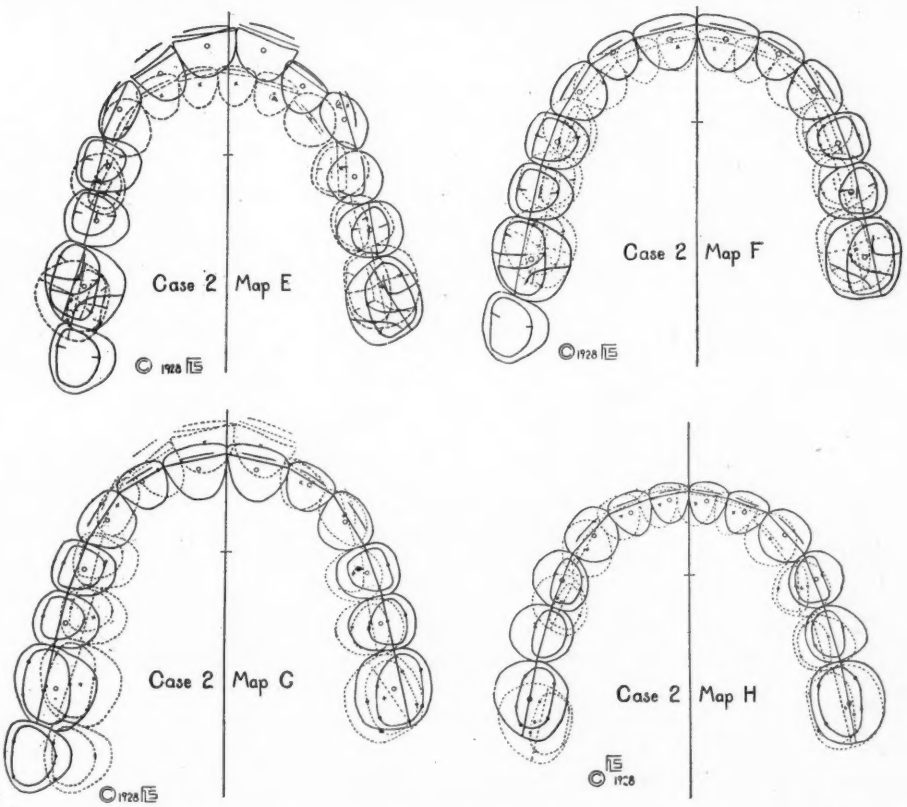
Map A.—Malocclusion. Solid line shows the maxilla; dotted line shows the mandible.

Map B.—Proposed occlusion. Solid line shows the maxilla; dotted line shows the mandible.

Map C.—Diagnostic map of maxillary treatment. Solid line shows the malocclusion; dotted line shows the proposed occlusion.

Map D.—Diagnostic map of mandibular treatment. Solid line shows the malocclusion; dotted line shows the proposed occlusion.

Fig. 2.—Case 2. Occlusal view, right side, front view, left side.



Map E.—Malocclusion. Solid line shows the maxilla; dotted line shows the mandible.

Map F.—Proposed occlusion. Solid line shows the maxilla; dotted line shows the mandible.

Map G.—Diagnostic map of maxillary treatment. Solid line shows the malocclusion; dotted line shows the proposed occlusion.

Map H.—Diagnostic map of mandibular treatment. Solid line shows the malocclusion; dotted line shows the proposed occlusion.

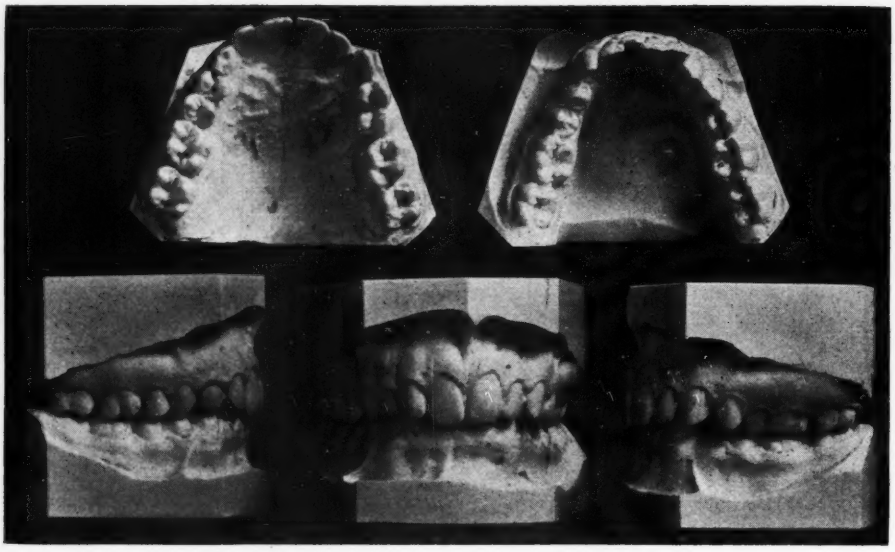
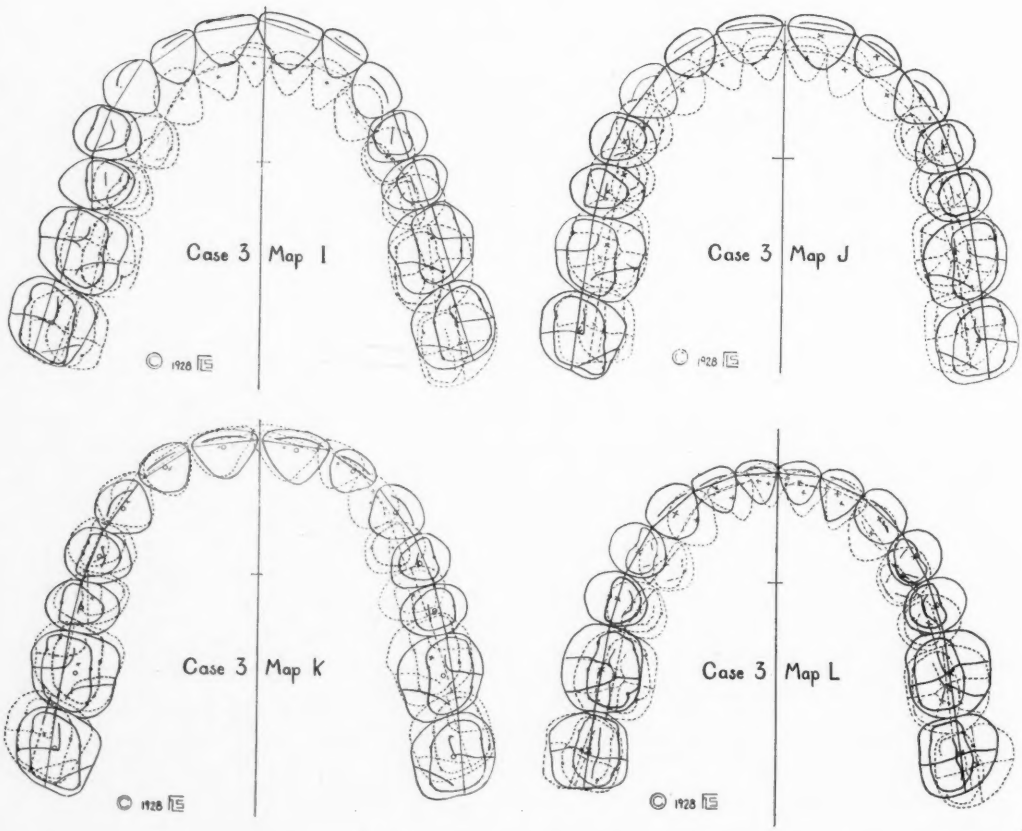


Fig. 3.—Case 3. Occlusal view, right side, front view, left side.



Map I.—Malocclusion. Solid line shows the maxilla; dotted line shows the mandible.
Map J.—Proposed occlusion. Solid line shows the maxilla; dotted line shows the mandible.
Map K.—Diagnostic map of maxillary treatment. Solid line shows the malocclusion; dotted line shows the proposed occlusion.
Map L.—Diagnostic map of mandibular treatment. Solid line shows the maloclussion; dotted line shows the proposed occlusion.

This most interesting case reveals how the slight shifting of individual teeth toward the midaxis, with the consequent shifting of the midlines, can produce a complicated malocclusion with but slight change of arch form. With diagnostic maps the indicated movements are not difficult to accomplish provided the steps are logically taken.

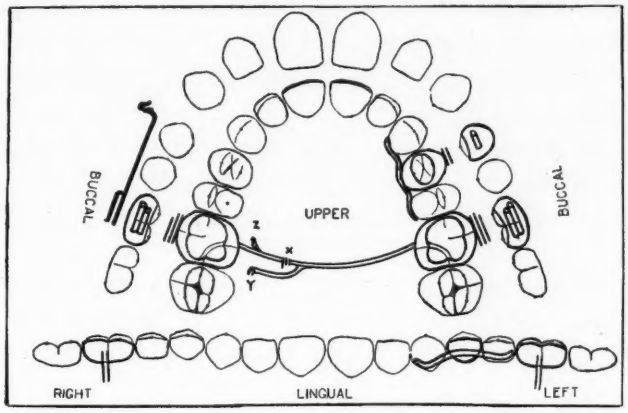


Fig. 4.—Upper appliance design, Map K, shows that the right first molar needs rotation and backward movement. The center of rotation may be found on the map. This center is at *X* on appliance design sheet. A hinged joint is made in the appliance vault wire at *X*. The arm *Y* is placed in such a position that an elastic from *Y* to *Z* will allow molar to move distally and to rotate. Arm *Y* also limits the motion of the molar and will cause it to stop in its predetermined position. A buccal wire fits in the tubes on left first molar and first premolar to stabilize anchorage on the left side (not shown in the drawing). The work model with bands is placed on the surveying apparatus and correctly related to the diagnostic map. The center of rotation at *X*, the location of arm *Y* and its relation to *Z* can be marked on the model with the surveying apparatus for the proper constructing of the appliance.

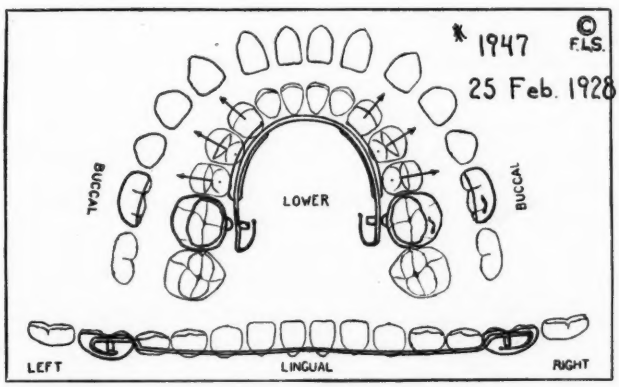


Fig. 5.—Lower appliance design. Map L exhibits no unusual movements hence a simple appliance with finger springs. After the rotation of the upper right first molar and indicated movements (forward and outward) of the right lower canine and premolars, an intermaxillary elastic should adjust the slight mesiodistal malocclusion that will exist at that time.

Case 2.—Map G has the same characteristics as Map C of Case 1. The left molars and premolars are nearer the midaxis than the corresponding teeth on the right. The left canine is occupying a part of the left lateral space causing disturbance of the incisors. This case is complicated by rotation of the right first molar.

Map H is similar to Map D, Case 1. The right canine and first premolar are nearer the midaxis than the corresponding teeth on the left. The midline is to the left toward the distal occlusion. In this case the mesiodistal mal-

relation is to be corrected by the forward movement of the mandibular teeth in contrast to Case 1 where the backward movement of the maxillary molar equals the forward movement of the mandibular molar, a most important thing to know in planning treatment.

CASE 3.—Map K shows mesiodistal malrelation on the right, hence the right first molar, premolars and canine are nearer the midaxis causing incisal disturbance and moving the midline to the left of axis.

Map L shows the left molar, premolars and canine nearer the midaxis and midline shifted to the right.

In this case the maxillary right molars must be moved back a greater distance than the forward movement of the mandibular molar.

In Case 1 the mesiodistal relation requires a 50-50 movement of the first molars.

In Case 2 the principal front to back movement is confined to the mandibular first molar.

In Case 3 the maxillary first molar is more at fault than the mandibular first molar.

These three cases diagnosed by means of a precise formula should prove:

1. There is no constancy in the position of the maxillary molar as a diagnostic point.

2. That no matter what the plan of the finished arch may be, the operator should relate the configuration of malocclusion and occlusion to show the least tooth movement.

3. Appliances can be more efficiently designed and treatment expedited where all movements are accurately plotted in advance of treatment.

The Orthodontic Department of New York University loaned the models and maps of Case 2.

For the painstaking care in the preparation of the India ink drawings, the author gratefully acknowledges the aid given by his associates, Doctors Mason, Huber and Denbo, and Ethel Luck, D.H.

121 EAST 60TH STREET.

A SLIT TUBE TO BE USED*

First: To Make Stress-Breaking Space Retainers
Second: In Conjunction With Lingual Appliances

By Bercu Fischer, New York, N. Y.

THE first part of the paper deals with a slit tube used in making a stress-breaking space retainer.

The early loss of deciduous or permanent teeth causes different forms of malocclusion. Extensive studies have been made by many workers on malocclusions due to loss of teeth.

Kantorowitz after an investigation made at the University of Bonn into the causes of malocclusion in children stated in a paper under the heading of "Hindrances of Growth as a Result of Untimely Tooth Removal," that "the harmful period is between the fourth and twelfth years of age during the growth of the jaws. The early loss of teeth represents the most frequent cause of malocclusion."

Again quoting Kantorowitz: "The investigation of the jaws of children twelve years old teaches us that the growth of the jaw is impeded by the width of one premolar (that is half a molar) if an extraction of the first molar has taken place at the time from six to seven years of age."

In *A* of Fig. 1 is shown a full complement of teeth. *B* shows loss of a molar. *C* shows drifting of the teeth to close up the gap. *D* shows closing of the gap and shifting of the median line to a point between the central and lateral incisors.

Continuing with the quotation, "In case of an extraction which takes place two years later, that is during the eighth year of age, the shortening of the jaws measures about the width of half a premolar."

Fig. 2 shows the median line passing through the middle of the central incisor.

Fig. 3 shows the loss of a tooth at eleven years of age with no shifting of the median line.

Continuing Kantorowitz, "These same phenomena can be formulated as a general law: In case a tooth is removed before the full growth of the jaw and in case the gap has been closed or diminished, the teeth in front of the gap have a distal position in relation to the other (sound) side."

Dewey says on the same subject: "When we speak of deciduous teeth as factors in the development of the dental arch, we must remember the stimulating effect which these teeth produce as organs of mastication and also the action which they have through the inclined planes of the cusps and

*Read before the Annual Meeting of the Alumni Society of the Dewey School of Orthodontia, Hotel Vanderbilt, New York, August 29, 30, 31, 1927.

the approximal contact. If one deciduous molar is lost prematurely, just that much of a stimulating effect has disappeared. The cusp relation is destroyed and the approximal contact broken.

"Because of loss of approximal contact the teeth drift together and cause a shortening of the dental arch, which in turn results in abnormal development of the arch and face.

"We see a large number of impacted premolars resulting from the early loss of the deciduous teeth, which also causes a closing of approximal spaces."

Fig. 1.

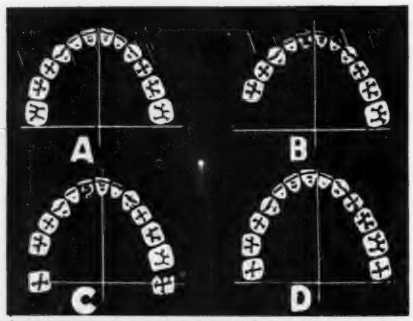


Fig. 2.

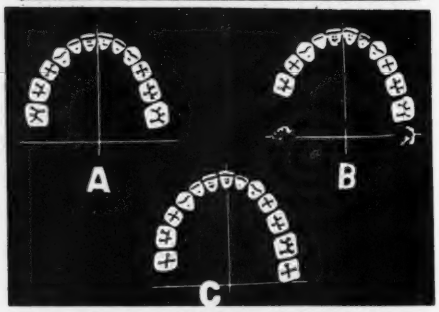
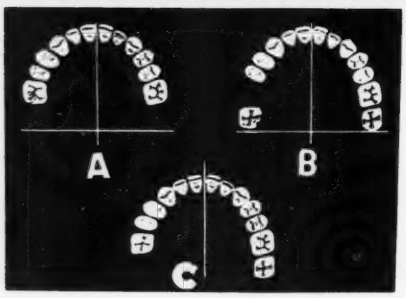


Fig. 3.



Young makes the following statement on the same subject: "Premature loss of deciduous canines and molars in either the maxilla or mandible permits the permanent teeth adjacent to the lost tooth to drift from their normal positions and encroach on the space that should be occupied by their permanent successors. Whenever it is possible to maintain the space where such teeth are lost, it is advisable to do so."

Fig. 4 shows the occlusal view of models of the jaws of a four-year-old child. The maxillary first deciduous molars have been lost. The space should be retained to prevent impaction of premolars.

Fig. 5 shows lateral and front views of the same case.

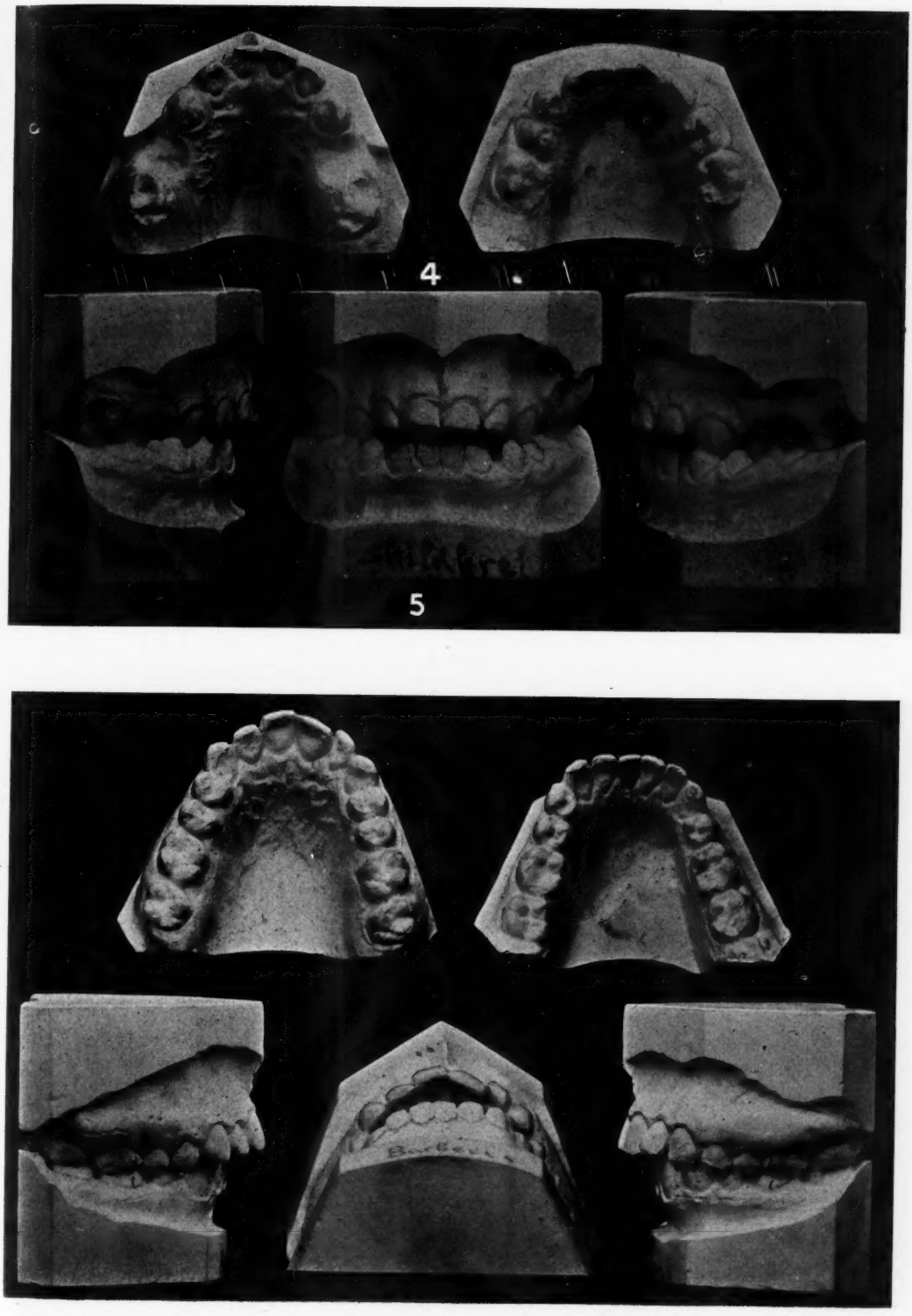


Fig. 6.

Fig. 7.

Fig. 6 shows occlusal view of models of the jaws of a fifteen-year-old patient. The right mandibular second premolar is missing. The first premolar is in contact with the first molar.

Fig. 6 also shows lateral and front views of the same case. The median line of the mandibular teeth has shifted to the right a distance of half a premolar. There is an open bite due to the drifting of teeth.

Fig. 7 shows occlusal view of models of the jaws of a twelve-year-old patient. The left mandibular first permanent molar has been lost. The gap is partly closed due to drifting of teeth.

Fig. 7 also shows a lateral and front view of the same case. There has been a shifting of the median line of the mandibular teeth to the left. The maxillary canine on the left side occludes anteriorly to the mandibular canine. An extreme overbite has developed because of the posterior drifting of the lower teeth.

Fig. 8 shows the occlusal view of models of the jaws of a twenty-two-year-old patient. The mandibular first permanent molars have been lost. The gap on each side has been partly closed by the drifting of the teeth.

Fig. 9 shows the lateral and front views of the same case. The overbite and the distal position of the mandibular teeth are similar to those deformities present in distoclusion cases. The molar relation in this case is normal.

What has been said so far indicates the important rôle which early loss of teeth plays in the development of malocclusions. The need to maintain a full complement of teeth throughout the developing period of the individual is evident. However, this preservation is not always possible. In cases where teeth have been lost it is necessary to maintain the space in order to lessen the development of malocclusion. To meet this need the space retainer has been developed.

The retainer which has been used consists of two bands joined by a soldered wire (Fig. 10). The wire being soldered at both ends makes a rigid appliance allowing no individual movement of the banded teeth.

Great difficulty is met in fixing these appliances in the mouth since all the bands have to be cemented simultaneously.

The restricted movements of the teeth in their fixed position tend to loosen the appliance, necessitating frequent recementation.

These disadvantages have prevented the general use of the retainer.

To overcome the objections of the fixed retainer the following stress-breaking appliance has been developed (Fig. 11). A 16 gauge tube of a platinum gold alloy is used. Three-fourths of an inch of one end of the tube is filed with a flat file to a tissue paper thickness. The filed surface of the tube is slit with the sharp edge of a knife. If the tube is not slit readily, the filing should be continued until a yielding surface is obtained.

A wire two gauges smaller than the tube is inserted one inch into the slit end of the tube. By using the inner surface of the tube as a fulcrum the wire is forced through the slit, thrusting the thinned lips aside. This produces an opening the same width as the wire. The protruding edges of the slit are removed by a chisel and then polished with a square edged felt wheel. The finished slit should allow the wire to snap in and out of position.

The tube is soldered to the band on the longer tooth. It then is sawed off about one-eighth inch from the band. The length of the tube remaining attached to the band varies with the space between the teeth.

A bite and impression are taken with bands in position, from which a model is made and articulated.

On the model in Fig. 12 a piece of wire equal to the distance between the bands is snapped into the slit tube at one end and soldered to the other band at the other end. This wire is the same as the one used in making the slit tube.

In Fig. 13, *C* shows the appliance completed. The stress-breaking space retainer has the following advantages:

1. The wire, being two gauges smaller than the tube, allows play, thus insuring free movement of the teeth.

Fig. 10.

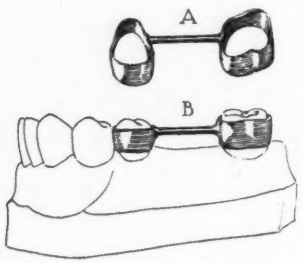


Fig. 11.

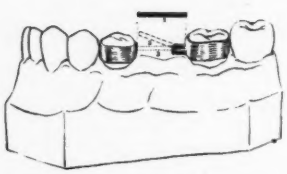


Fig. 12.

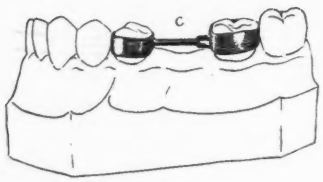


Fig. 13.

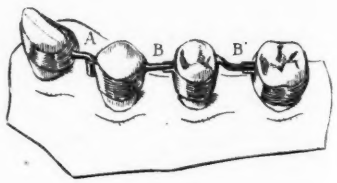


Fig. 14.

2. The slit of the tube being of the same width as the wire prevents the band when loosened from falling into the patient's mouth.

3. In placing the appliance in the mouth, the band carrying the slit tube is cemented first. Then the band with the wire is cemented by snapping the wire into the tube and driving the band into position. This is of value especially in the use of the compound stress-breaking retainer which is shown in Fig. 14.

At *A* (Fig. 14) is shown another form of stress-breaking retainer for anterior teeth.

At *B'* the wire is curved to correspond to the curvature of the gum.

In concluding the first part of the paper the following summary is presented:

The need of maintaining the space after loss of teeth has been recognized and the space retainer introduced. The many disadvantages of the

fixed type of retainer prohibit its wide use. To overcome these disadvantages the stress-breaking principle in the form of the slit tube appliance is offered.

The values of the stress-breaking principles are:

1. There is no interference with the individual movements of the teeth, thus preserving a normal state of health in the surrounding dental structures.

2. It permits cementation of individual bands thus giving a greater range of application to the appliance.

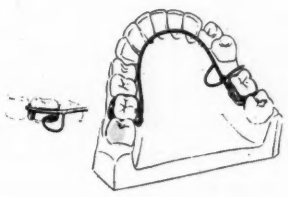
SECOND PART

Since the development of the slit tube for the space retainer, its use has been extended to lingual appliances.

In Fig. 15 the slit tube is the same as that described in the first part of this paper. This slide shows the making of the tube and its attachment to the band by solder. *E* shows the finished slit tube soldered to the band.

Fig. 15.

Fig. 16.



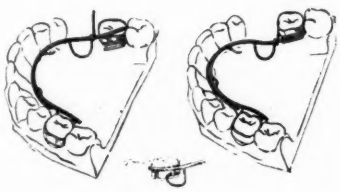


Fig. 17.

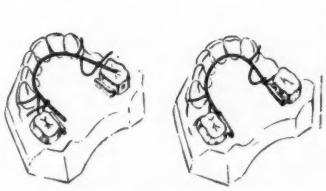


Fig. 18.

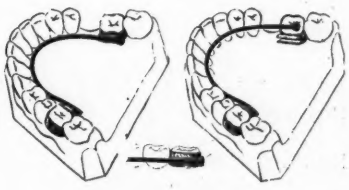


Fig. 19.

The above-mentioned slit tube has been used to modify the lingual appliances used in the treatment of certain types of malocclusion.

In neutroclusion cases with a forward drifting of the molar on one side the following appliance with which you all are familiar has been used (Fig. 16). It consists of a lingual arch wire 18 gauge attached to the band on the right molar by means of a Dewey lock. On the left side the wire has a follow-up spring to move the molar posteriorly and rests in a 16 gauge ring attached to the lingual surface of the molar band.

The use of the ring on the molar presents two objections: First, difficulty is encountered in placing appliance in the mouth. The anterior teeth interfere with the insertion of the wire into the bore of the tube. When the molar is short and tilted, the insertion of the wire is almost impossible. Second, irritation of the tongue results from friction against the protruding end of the wire.

Fig. 17 shows the same appliance using the slit tube instead of the ring. The wire is snapped laterally into the tube. When these teeth are in a lingual

position, it is possible to carry them buccally by means of this appliance. This is done by producing an outward kick in the wire before it is snapped into the tube.

In those cases where it is necessary to move back the molars on both sides, the labial appliance has been used. This is accomplished by ligating the anterior teeth which are used as anchorage to the labial arch wire and tightening the nuts against the tubes. Often intermaxillary anchorage is necessary. By means of the slit tube the lingual appliance could be used to accomplish this movement.

Fig. 18 shows a lingual appliance used to move the molars on both sides back. Each anchor band carries a slit tube. The arch wire is snapped into the tubes from the lingual side. The anterior teeth are used as anchorage, and two follow-up springs exert the force on the molars. To secure the anchorage of the teeth anterior to the molars, two extension wires are used. These are soldered to the base wire and rest against the distal surfaces of the canines.

In cases in which it is necessary to carry a molar forward the following lingual appliance may be used (Fig. 19).

This appliance is fastened by a Dewey lock to the normal molar. The abnormal molar carries a slit tube into which the base wire is snapped. The arch wire is warped to produce the forward movement of the molar. In order to carry the molar forward a disk is soldered to the end of the wire.

The same appliance may be used in the treatment of unilateral distoclusion cases.

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2 EAST 54TH STREET.

DISCUSSION

Dr. Margolis suggests that the objection of the wire protruding through the ring and irritating the tongue, may be overcome by bending the wire to follow the lingual surface of the tooth. By such a procedure, the insertion of the curved wire would be rendered more difficult.

Dr. Thompson asks whether there is no danger when using the lingual appliance with the slit tube to carry teeth forward of producing lateral movement of these teeth at the same time. This danger of carrying the teeth laterally when forward movement is intended is not peculiar to the slit tube but is characteristic of all appliances used for similar treatment.

The retainer described by Dr. Williams to produce movement of the tooth, as well as to retain the space, does not permit movement in a definite direction. There is a possibility of the anchor tooth moving.

Before closing I wish to thank the members of this society for their attention and criticism.

ORTHODONTIC METALLURGY*

By R. V. Williams, Buffalo, N. Y.

MY SUBJECT is orthodontic metallurgy, but I have been requested primarily to make observations, if possible, of a practical nature, based on the complete step to step technic as performed by Dr. Oren A. Oliver.

In my correspondence with Dr. Spencer, also Dr. LaGrow, who were in turn to discuss my observations, I stated that my paper would be in the nature of a short demonstration, showing a possibility of obtaining by electrical methods, equal or better results in the construction of appliances, due to a more perfect control of heat. I have since found out that the current in this hotel is not suitable and a special line could be brought in only at considerable expense, consequently, due to this and the great lack of time, I must omit the demonstration.

I can state, however, that this demonstration would only furnish ideas upon which a great deal of research would still have to be carried out, before we could even approximate the wonderfully interesting technic as demonstrated by Dr. Oliver.

I still feel confident, however, that electrical heat, under absolute control, whether it be by induction or resistance, will eventually find its place in the orthodontic laboratory, where soldering, annealing, and other forms of heat-treatment play such an important part. This again brings home the importance of the close cooperation which is necessary between the orthodontist and metallurgist.

A great deal of research has been and still is being conducted on the metals which you are using. I do not feel inclined, however, to burden your minds with technical details of the involved metallurgy, metallography and physical testing.

Manufacturers of precious metals have a direct obligation to your profession, and after a manner, to the public. However, even if for nothing more than their own selfish interests, they should, and do, devote every effort toward a thorough understanding of your ideal requirements, also the complexities which arise in proper manufacturing.

There is no question but that great progress has been made during the past few years. My personal survey of all available materials made eight years ago cannot be compared with a survey made within the last year. There is far greater accuracy in dimensional measurements also corresponding improvements in physical properties.

Changes have been made and no doubt will continue to be made as improvements suggest themselves, or are suggested by the profession. An examination of the materials used in your daily practice or in this extremely

*Read at the meeting of the American Society of Orthodontists, Buffalo, N. Y., April 30-May 2, 1928.

interesting clinic of Dr. Oliver's, will, I believe, prove my point. From my examination of his work, I have nothing to criticize but on the contrary, have much to learn.

DISCUSSION

Dr. Asa J. LaGrow, Oak Park, Ill.—I have not had the opportunity to read the essayist's paper at all. He did not intend, as he already told you, to read a paper, but to show some things that probably would hardly need a discussion.

It appeared to me several years ago that an electric method of soldering should be devised for our work. My idea, of course, is entirely empirical in this. It was called to my attention by observing a jeweler do some electric soldering. It was on spectacles, I think, and some other fine soldering. It seemed to me that by a few changes the apparatus could be made suitable for our use.

Very often in my office the blowpipe flame is shifted to one side by a draft. Sometimes a door is opened when I am about to make a fine soldering and the flame is not at the right point at the right time. If we could have a reliable electric soldering device, I think we would have more accurately soldered joints than is possible with gas.

Case Reports

UNUSUAL FRACTURE CASE TREATED WITH ORTHODONTIC APPLIANCES*

By Dr. Herbert A. Pullen, Buffalo, N. Y.

THE subject of this case report is a young woman, twenty-two years old, who suffered a peculiar combination of fractures of the maxilla in an automobile collision. She was seated in the front seat of the car; the impact of the collision threw her violently forward, the edge of the cowl beneath the windshield striking the maxillary and mandibular incisors, nearly all of which

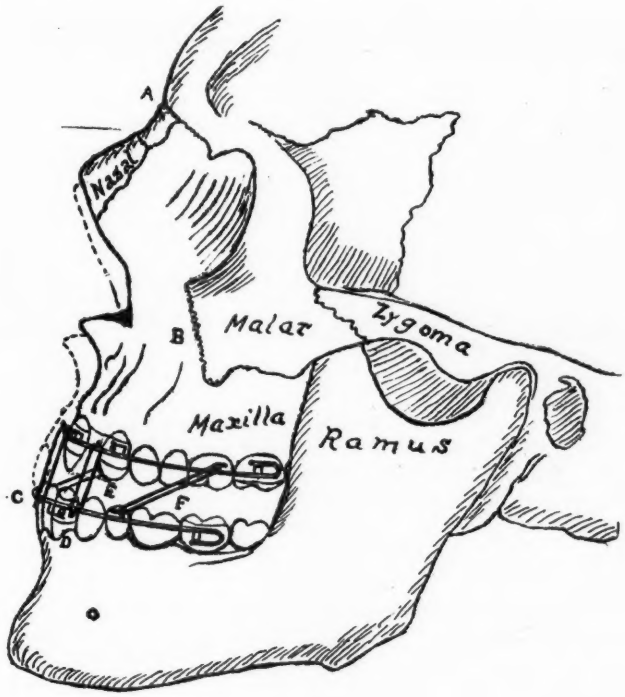


Fig. 1.

were knocked out. The severity of the blow on the maxilla broke up the attachments to the malar bones behind which it was firmly wedged in being driven backward, and no efforts on the part of the oral surgeons could move the maxilla forward again.

The maxilla was driven backward at least half an inch so that it was wedged behind the malar sutures *B*, Fig. 1, on each side, and upward so that the nasal bones overlapped the attachment to the frontal bone, at *A*.

The occlusion of the case before the accident was nearly normal, whereas after the accident the occlusion simulated that of a mesioclusion case, with the additional complication of an anterior nonocclusion as shown in the casts on the left of Fig. 2.

*Read before the American Society of Orthodontists, Buffalo, N. Y., April 30-May 3, 1928.

The maxilla could be rotated in its abnormal position but could not be pulled forward with the fingers or with instruments without the possibility of laceration of the tissues. The oral surgeons finally decided that the use of orthodontic appliances would more humanely and accurately restore the maxilla to its former position and the occlusion of the remaining teeth to normal.

The reduction of the fracture and the moving forward and downward of the maxilla from its firmly wedged position behind the malar bones seemed the only feasible method of treatment. The use of intermaxillary force operating from firmly attached appliances on the teeth of the mandible (used phalanx as anchorage) to appliances rigidly attached to the teeth of the maxilla was decided upon.

Pin and tube appliances were placed upon each dental arch, and hooks for vertically as well as mesiodistally placed intermaxillary elastics were at-

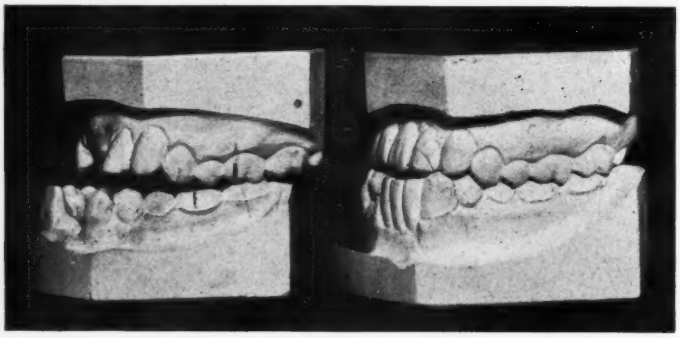


Fig. 2.

tached to these appliances. Begininng with one pair of vertically operating elastics, *C* and *D*, and one pair of mesiodistally operating elastics, *E* and *F*, additional pairs of elastics were added from time to time until the force was sufficient to move the maxilla forward and downward from its wedged position and into its former occlusion with the mandible.

After three weeks of manipulation with the intermaxillary force the maxilla was restored to its former position, the upper and lower appliances were wired together to secure fixation, and a period of four weeks allowed to elapse with the teeth in this position without mandibular movement. The final occlusion after treatment and construction of temporary bridges for the missing teeth by the family dentist is shown in Fig. 2 in the casts on the right. The patient made a good recovery, and the facial profile was restored to its original conformation to normal configuration.

675 Delaware Avenue.

A CLASS II DIVISION 2 CASE COMPLICATED BY CONGENITALLY MISSING LEFT MANDIBULAR LATERAL*

By Harold E. Sippel, D.D.S., Buffalo, New York

IN PRESENTING this report I wish to show progress to date of a Class II, Division 2 case, complicated by congenitally missing left mandibular lateral. Fig. 1 shows case before starting.

Work was started two years ago. Patient was a girl, age, nine years, two months. She was a mouth breather. Her tonsils and adenoids were never removed. Rhinologic examination shows no nose obstruction and throat in very good condition.

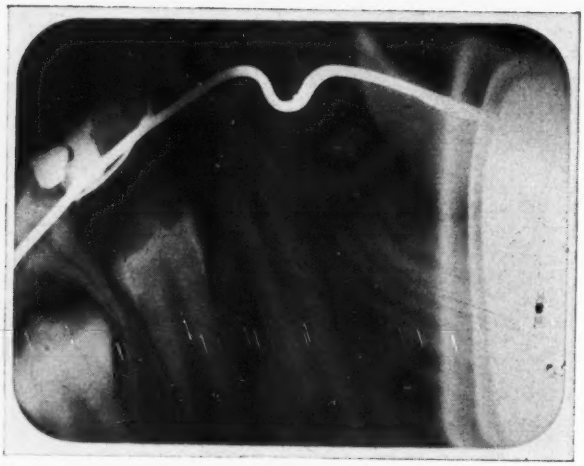
Fig. 1.

The left deciduous lateral and canine which were two distinct crowns with but one root, were extracted before patient was at my office. X-rays show left permanent lateral to be missing. Fig. 2.

Appliances were removed from time to time while patient was vacationing.

Maxillary arch was fitted with high labial arch 18 gauge with spurs against the incisors. Intermaxillary hooks were soldered at convenient points on the arch. At the present time patient is wearing plain labial arch, with band on left cuspid, which has just erupted in torsoversion. Right canine just beginning to erupt.

*Read before the American Society of Orthodontists, Buffalo, N. Y., April 30-May 3, 1928.



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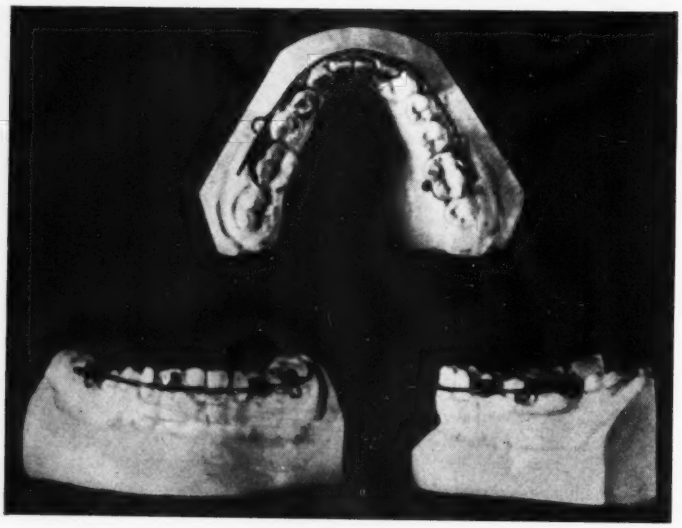


Fig. 3.

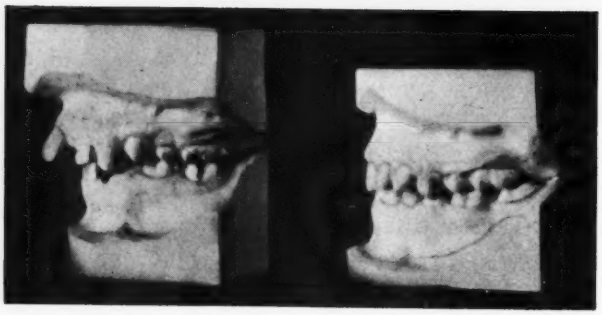


Fig. 4.

Fig. 5.

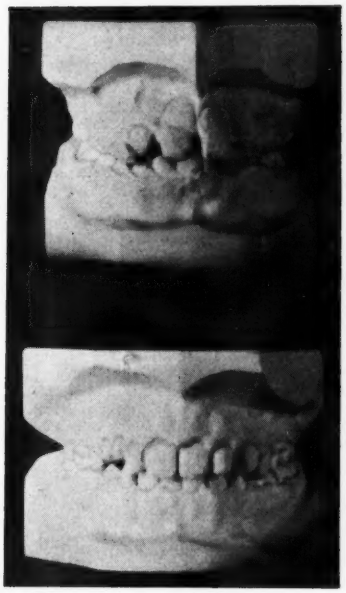


Fig. 6.

Fig. 7.

Mandibular arch was fitted with looped lingual arch to obtain slight expansion, as the four deciduous molars were still in place and permanent canines unerupted. Intermaxillary force was applied. Upon loosing deciduous molars, lingual arch was removed and labial arch 19 gauge placed, using round tubes on molar bands. A little later bands with McCoy open tube attachments were cemented on left first premolar and right lateral. Fig. 3.

Fig. 8.

Intermaxillary force was renewed, and as Fig. 4 shows, all lower teeth on left side were moved forward. Left first premolar still has to be moved labially and mesially bringing second premolar and molars a little further forward.

Fig. 5 shows right side in normal occlusion. Fig. 6 displays front view before and now. Fig. 7 shows occlusal views. Fig. 8 illustrates front and profile views of face before and now.

I shall be glad to show completed case at some future date.

201 Curtiss Building.

Clinics

INDIRECT MOLAR BAND TECHNIC*

By Abraham Lees, Sc.B., D.D.S., New York, N. Y.

THE aim of this clinic is to present a method for making anchor bands that will fit with a high degree of accuracy on bell-crowned molars. It should appeal especially to those operators who resort to swaging for the sake of producing an accurately fitting band and is especially applicable to fully erupted molars such as those seen in patients of twelve years and older. Since a band made by any indirect method can fit the tooth no better than the accuracy of the impression will permit, attention was focused on obtaining as accurate and complete an impression as possible, with special regard for the anatomy gingival to the contact points.

The tooth to be banded is isolated by means of 24 gauge wire ligature placed for a few days. It is then cleaned and an impression of it is made. This is taken in two sections and may be made in plaster or modeling compound. Both materials give equally accurate impressions, but the subsequent treatment of these differs.

Making the Tray.—A sectional tray is made of stiff sheet metal such as aluminum or nickel silver about 26 gauge in thickness. A strip of this material two and one-half inches long and one and one-quarter inch wide is cut across in the center. Of the resulting strips one is bent through the center to an obtuse angle, and one side is shaped to conform to the buccal curvature of the arch. In the second strip a right angle bend is made one-eighth inch from the edge, then another bend one-half inch away from the first, giving an obtuse angle. The flat end of this strip is then shaped to conform to the lingual form of the arch. The bending is most conveniently done over the edge of an anvil with the aid of a hammer, while the flanges are shaped by means of flat nose pliers. Such a tray made of nonrusting material is rigid and can give good service for a long time.

Taking the Impression.—A strong clean-fracture plaster is mixed to a thick creamy consistency and placed in the lingual section of the tray (having the double bend). This is then brought to position in the mouth on the lingual side of the molars and placed so that the rib of the tray (one-eighth inch bend) rests on the bucco-occlusal margins of the teeth. This rib acts as a guide for placing the tray and also provides a definite thickness of plaster on the occlusal surfaces of the teeth. When hard the excess plaster is removed from the teeth about the tray, then the tray is removed in a linguo-occlusal direction. It is essential to preserve as much of the embrasures of the tooth as possible, for, as is well known, the greatest constriction of the tooth is in the mesiodistal direction. The plaster is now cut away flush with

*Clinic presented before the meeting of the American Society of Orthodontists, Buffalo, N. Y., April 30-May 3, 1928.

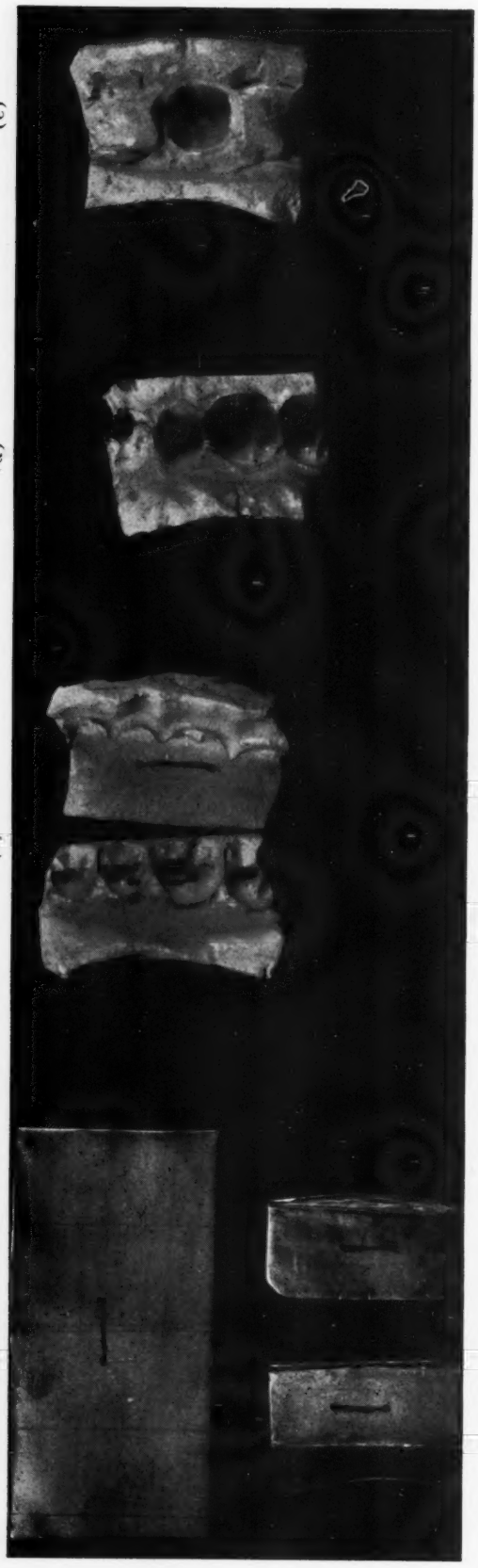


Fig. 1.

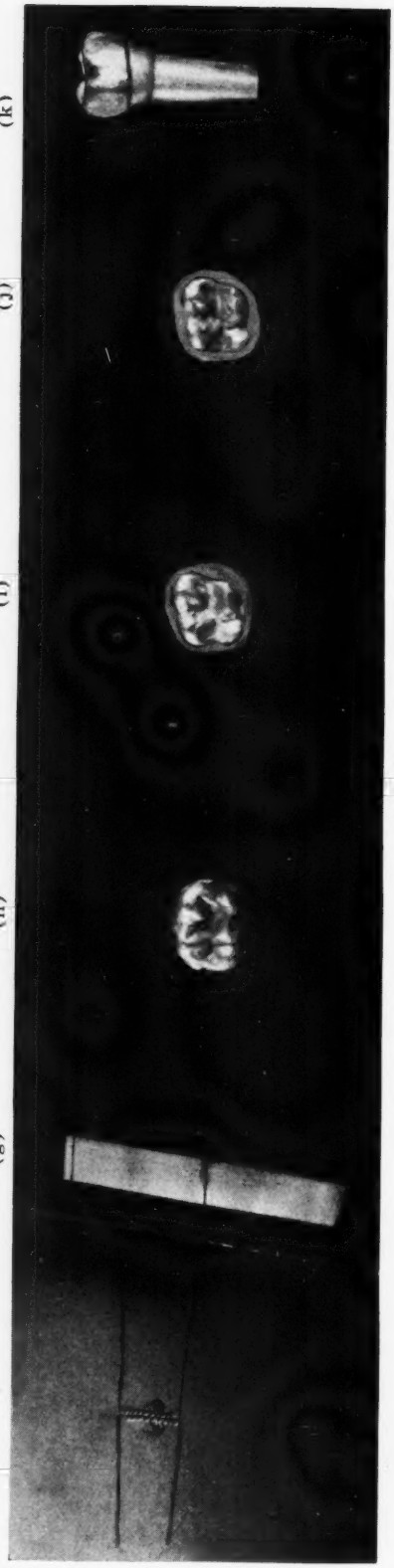


Fig. 2.

the occlusal rib of the tray, this narrow surface coated with vaseline, and the section replaced on the teeth. The second section is now filled with soft plaster and placed on the buccal side of the arch so as to overlap the first section on its entire occlusal surface and to provide a one-eighth inch thickness of plaster between the two occlusal sections. When hard this is trimmed and removed and finally assembled and fastened with sticky wax. The occlusal thickness of plaster provides a solid base for assembling the sections. When two molar bands are to be made, time can be saved by making both lingual sections out of one mixing of plaster and the two buccal sections of the second mixing.

When modeling compound is used for taking the impression, the material is softened in the usual manner, and the lingual section of the impression is made and trimmed. When the buccal section is forced into position, it is necessary to exert some pressure on the lingual section to prevent its dislodging. The same rules as to placing of the tray sections apply in the use of modeling compound as well as in the use of plaster.

Preparation of Molar Impression.—The plaster sections are assembled and fastened together with sticky wax. The impression of the anchor tooth is then painted with liquid soap, and the ridge corresponding to the gingival crevice around this tooth is then marked with indelible pencil. The entire impression is now wetted, a bit of impression plaster mixed and a slight crest built up around the buccal and lingual gingival edge of the anchor tooth about one-eighth inch above the pencil mark. With the same batch of plaster the adjacent teeth are filled in so as to isolate the anchor tooth. This is the most important step in the treatment of the impression, as on its careful execution depends the correctness of the resulting model. In isolating the tooth it is necessary to observe the curvature of the embrasures, and to follow and extend these slopes at the mesial and distal sides of the tooth, for it is at these sides that most of the molar teeth are undercut and where many anchor bands fail to fit. The newly built up ridge is now trimmed so as to deepen the molar impression to the extent to which the band is to go beneath the gingival margin. Here we are guided by the pencil line previously made at the gingival crevice. Here as in the embrasures the carving must be done in the direction indicated by the impression. The soap used before facilitates the removal of any plaster that may accidentally have fallen into the molar impression. This carving is best done with a large spoon excavator or an old curette, which by the same operation creates a mold for a small round base for the metal die to be made in the next step.

Fig. 1.—(a) Material for impression tray; nickel silver sheet, 26 gauge 2¼″ by 1¼″. (b) Sectional tray; the short bend 1/8″ from edge is to be placed at buccal ridge of teeth where it acts as guide. (c) Sectional impression; substantial layer of plaster is desirable for stability of assembled parts. (d) Impression assembled, anchor tooth coated with liquid soap, and gum margin outlined. (e) Anchor tooth isolated and margin raised as much as finished band is to go beneath free margin of gum. This is done by adding soft plaster to moistened impression then carving away excess. At this step care must be taken to follow direction of undercut surfaces as indicated by slope of walls.

Fig. 2.—(f) Wire measures of tooth: circumference at level of greatest bulge, 38.6 mm.: circumference at gingival edge of band, 36.2 mm.; difference is the unavoidable slack of band at gum margin, 2.4 mm. (g) Band material cut, allowing for lap joint. (h) Model of tooth obtained by pouring fusible metal (Ney's Dialoy) into mold obtained in step (e). Model polished gently with pumice. (i) Band material annealed, soldered and fitted roughly over tooth, burnished into grooves and undercuts. (j) Band swaged on model. (k) Band boiled in nitric acid, polished and fitted on original tooth.

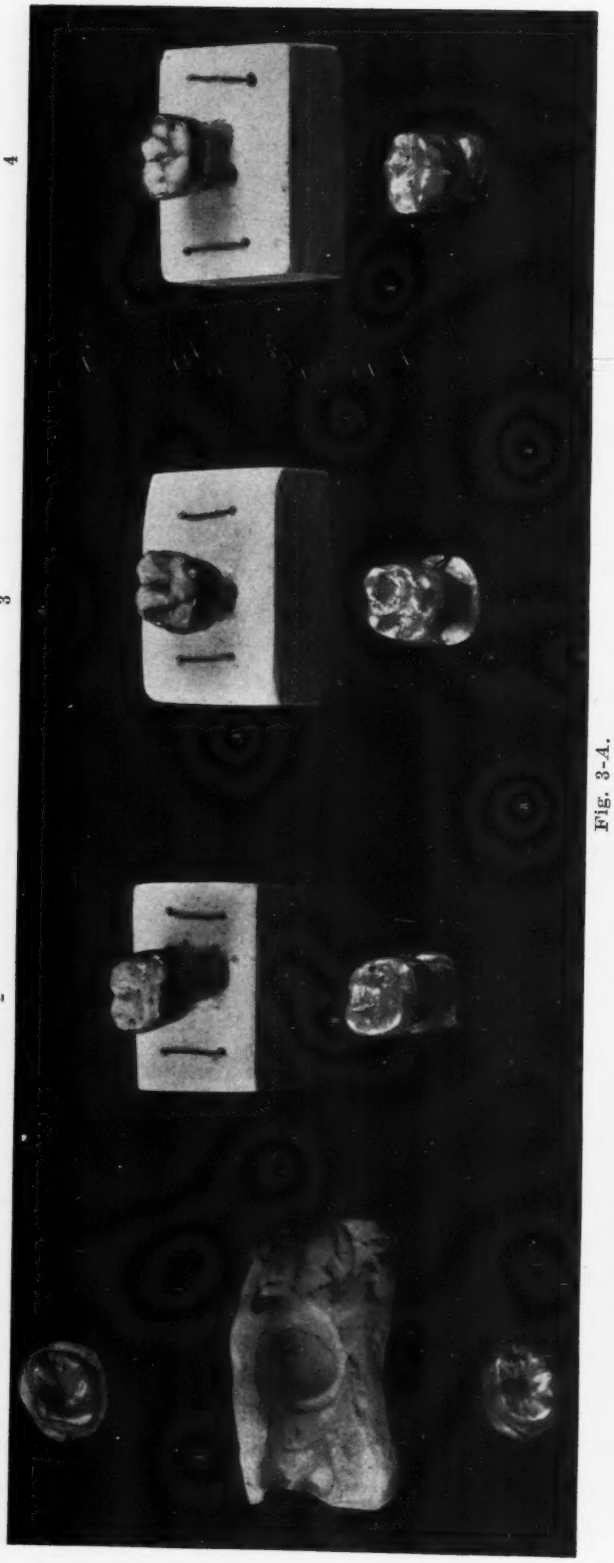


Fig. 3-*A*.

Fig. 3-*B*.

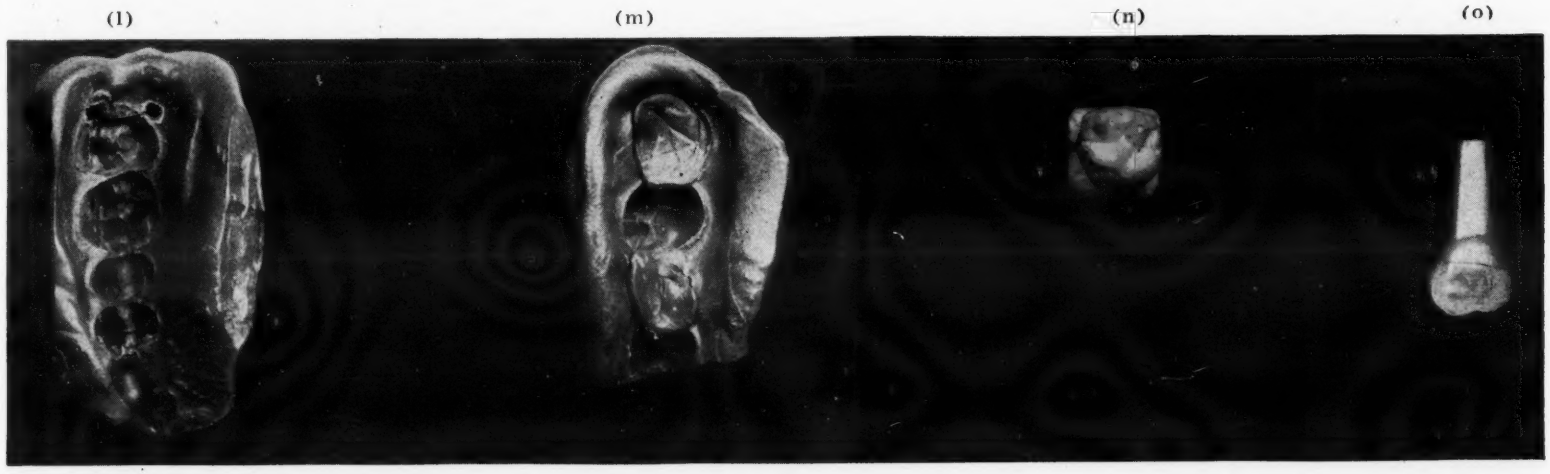


Fig. 4.

Fig. 3-*A*.—Specimen bands. (No. 1.) Practical case. Measurements of molar made in mouth: circumference at greatest diameter, 36.5 mm.; at gingival edge of band, 36 mm.; unavoidable slack at gingival margin, 0.5 mm. (No. 2.) Extremely undercut upper molar. Circumference at greatest diameter, 37.4 mm.; at gingival edge of band, 35.2 mm.; slack, 2.2 mm. (No. 3.) Upper molar. Circumference at greatest diameter, 37.2 mm.; at gingival edge of band, 35.5 mm.; slack, 1.7 mm. (No. 4.) Lower molar. Circumference at greatest diameter, 35.5 mm.; at gingival edge of band, 33.8 mm.; slack, 1.7 mm.

Fig. 3-*B*.—Side view showing undercuts of teeth.

Fig. 4.—Alternate method. Where teeth are fairly thick-necked, a stone model may be used to advantage. Generally there is the risk of injuring the stone model in removing the swaged band. Where a stone model is desired, a sectional compound impression is more convenient than, and at least as accurate as, a plaster impression. (l) Sectional compound impression of practical case (assembled). (m) Impression assembled and first molar isolated (dento-form model). (n) Stone model of first molar with gingival margin carved to proper depth. (o) Band swaged on model, polished, and fitted on original tooth.

This work on the impression may seem difficult, but it is not and usually requires less than ten minutes for each impression. It is the equivalent of preparing the anchor tooth on a model by cutting away the stone around the tooth. But since this cannot be done on a metal model, it must be done in the impression.

In preparing the modeling compound impression, the sections are assembled and fastened securely with sticky wax. The anchor tooth is isolated with base plate wax following the slopes and undercuts as indicated by the impression. The deepening of the gingival crevice may be done now with wax or in the stone model by carving away to the desired depth. A collar of base plate wax is built around the tooth to accommodate a small stone base.

Making the Model.—As soon as the plaster impression has been prepared, a melt is made of a low-fusing metal (fusing below 210° F.) and poured into the molar impression. For best results the metal should be heated slowly and only just hot enough to melt it. A small base is piled on top of the tooth to facilitate the handling of the model. In a few minutes the model may be separated by prying or sawing apart the impression. The metal die is polished smooth with pumice on a revolving brush. This die, if carefully made, is a very close approximation of the shape of the original tooth. It has been lengthened a definite amount, and the band to be made should rest on and fit snugly at its gingival shoulder.

The modeling compound impression having been prepared as described, a stone model of the anchor tooth is packed making a small round base for convenient handling. When hard the model is separated and the gingival crevice of the molar deepened, if this has not been taken care of in the impression, by carving in the usual manner.

From this point on, both the stone and metal models are subjected to the same operations in making the band.

Making the Band.—A wire measure of the tooth is taken at its greatest diameter. This is usually at the level of the contact points or just below this level. The loop is opened and straightened taking care to avoid stretching it. The end of the band material is cut at a slight slant and a mark made about one millimeter from this edge to allow for a lap joint. The wire measure is laid on the strip just beyond the mark and the second end cut off so as to converge slightly to the first end. The wire measure should be at the longer edge of the material. It is best to have the band fit very tightly on the model.

After joining the seam with 18 karat gold solder, the band is festooned and fitted on the model and brought down to the gingival shoulder. The seam is placed on the lingual side of maxillary molars and on the buccal side of mandibular molars. It is then adapted and burnished roughly into the grooves and partly over the mesial and distal marginal ridges. It is now removed, annealed, replaced, and swaged in the usual manner. In most cases the band will require the use of band-removing pliers for its removal after swaging. It will be found convenient to remove maxillary molar bands by

using the pliers first on the lingual side then on the buccal, while the reverse order applies on mandibular molar bands. After swaging on a metal model the band must be pickled in acid, preferably nitric, for a few minutes.

NOTES ON THE METHOD

The advantages of a swaged band are well known, chief among them being first the possibility of using a material of sufficient thickness and rigidity to insure against distortion in use, and second the fineness of fit and adaptation which is practically impossible to attain by burnishing.

The sectional plaster method of impression taking is indicated especially where the molars are so bell-crowned that a stone model would be injured in removing the swaged band. And where reswaging is desired or the model is to be preserved for future use, the metal model is the more reliable. On the other hand, the modeling compound method is the more comfortable for the patient, can be carried out in a shorter time, and the impression requires somewhat less elaborate preparation than does a plaster impression.

In all bell-crowned molars the constriction at the gingiva is greatest in the mesiodistal direction, while there is a compensatory enlargement buccal-lingually. Yet in most of these teeth the circumference at the gingival margin is smaller than that at the level of the contact points or just below this level. In teeth measured by the writer the range of difference has been from zero to two millimeters. It is obvious that in those cases where the circumference is appreciably smaller at the gum margin, there will be a degree of slack at this margin regardless of the method by which the band is made. However, it was found that in these cases that swaging the band is the method of choice; for in the process of swaging the band becomes reshaped and adapted to the model by cold working, so that it invariably becomes hard and springy, and it resumes its proper shape after it has been distorted in removing from the model repeatedly. The gingival slack distributes itself evenly all around the tooth, so that the band does not stand away from the model appreciably at any point.

2 East Fifty-fourth Street.

THE FRED WOLFSOHN MODEL TRIMMER*

By Fred Wolfsohn, D.D.S., San Francisco, California

THE Fred Wolfsohn Model Trimmer electrically operated has been designed to do away with the tiresome labor of hand model trimming and to obviate the complexities of other model trimmers.

The machine consists of an adjustable horizontal platform "A" and a movable vertical cutting portion "B." The vertical portion "B" contains the cutting blade "C," which is adjustable in a similar way to that used in a carpenter's plane. The belt drives from the motor over a pulley, which with a cam causes the blade "C" to move in an up and down direction with a

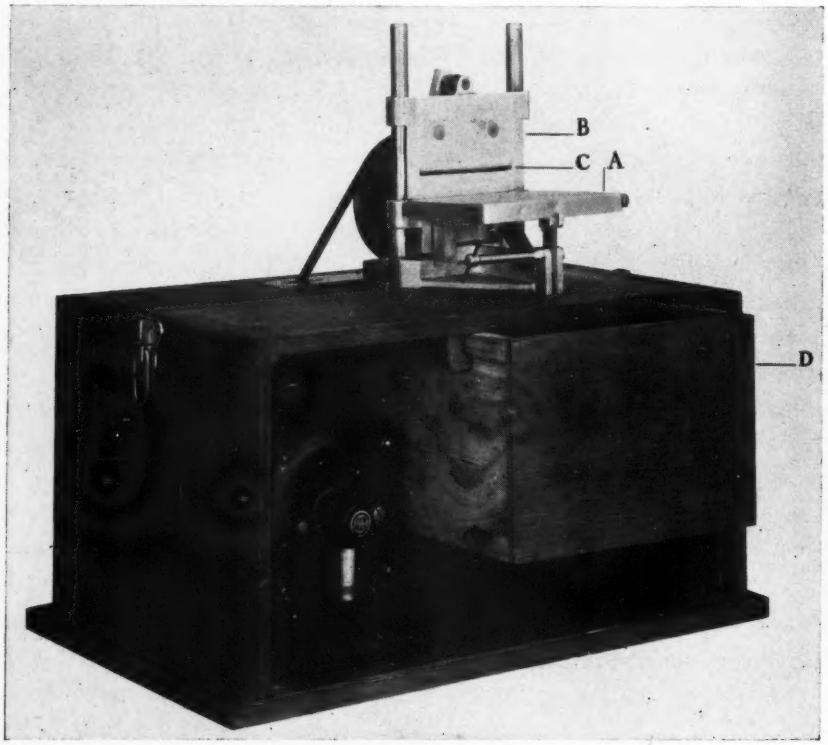


Fig. 1.

sweep of three inches. The down stroke of the blade does the cutting. The rough cast is reduced by placing it on the platform "A" and pressing it against the rapidly moving blade "C." The cut surfaces are smooth and the angles produced are sharp. The action of the machine being purely cutting, all dust is eliminated. The cuttings are deposited in a drawer "D" and maximum cleanliness is obtained. The trimmer being of such small dimensions can be placed in any laboratory. Its parts are made of materials that do not rust and are cleaned by simply rubbing with a moist sponge.

Among the economies provided by this machine may be mentioned:

*Clinic given before the American Society of Orthodontists, Buffalo, N. Y., April 30-May 3, 1928.

1. The important element of time saving, which in a busy office is very essential.

2. The actual time occupied to trim a model with the machine even without previous experience is from five to ten minutes. Hand cutting of casts usually takes from one to two hours and is very often not nearly so accurate.

3. Where much model work has to be done, one assistant can handle all the work with this machine.

4. The machine is fool-proof, easy to manipulate and safe.

5. From personal experience the trimmer materially reduces the overhead in this department of the office.

209 Post Street.

AN APPLIANCE FOR STIMULATING THE GROWTH OF THE DENTAL ARCH IN DECIDUOUS AND MIXED DENTURES*

By Dr. E. Santley Butler, New York, N. Y.

BANDS are made and cemented on the canines with lingual spurs to hold the lingual arch close to the gingival margin of the tooth. Bands are then fitted on the second deciduous molars, and an impression is taken with bands in place. The molar bands are then removed and placed in the impression; the impression poured and separated leaves the bands in the position that they will take when cemented in the mouth. On this model (Fig. 1) a lingual arch made from Ney-Oro Spring Wire 0.036 hugs closely the gingival margin of the first deciduous molars and canine teeth and is connected across the anterior portion of the arch by loops made of 0.032 Angle Retaining Wire. Opening of these loops about five hundredths of an inch and adjusting the width on the mesial or distal portion of the arch by the use of calipers will give the predetermined expansive movement when the arch is sprung into place.

Fig. 1.

576 Fifth Avenue.

*Presented at the meeting of the American Society of Orthodontists, Buffalo, N. Y. April 30-May 2, 1928.

MOVING PICTURES OF SURGICAL ORTHODONTIC CORRECTION OF ABNORMAL FRENUM WITH MALPOSED CENTRAL INCISORS*

By Victor Lay, D.D.S., Buffalo, N. Y.

THIS clinic consisted of a motion picture film depicting the different steps of treatment of this phase of orthodontia. The subject matter will best be understood by listing the subtitles in the picture, which were as follows:

In cases of abnormally large frenum with palatal insertion, the fibers form a band of elastic tissue constituting a resistance to the drawing together of the separated central incisors.

In these cases the possibility of drawing together the central incisors and retaining them is greatly reduced by the resistance of these abnormally attached fibers of connective tissue.

It is therefore desirable to remove the cause of the irregularity at the identical time of drawing the central incisions together.

The best age for removing these fibers is from six to eight years, although good results may be secured at other ages.

X-ray is made to determine the possible presence of supernumerary teeth or tooth buds, which may constitute an additional causative factor of the separated central incisors.

Field of operation is shown painted with merchurochrome.

Novocaine is injected into the frenum and at the nasopalatine foramen if any palatal removal is advisable. (In most cases the palatal attachment is slight and will not need attention.)

After the portion to be removed has been grasped and locked in a small hemostat, the tissue is dissected out with lancet and sharp pointed tiny scissors.

Cauterize with electric cautery or balled platinum wire in broach holder.

Paint tissue with merchurochrome.

The central bands have already been applied. They carry horizontal tubes through which a section of stiff wire has been passed to prevent tipping of the teeth as they are drawn together by a wire or silk ligature.

Healing is rapid, and little complaint has been noticed in the author's experience.

The straight wire acts as a retainer when the teeth are in apposition.

Medical Arts Building.

*Clinic presented at the meeting of the American Society of Orthodontists, Buffalo, N. Y., April 30-May 2, 1928.

TYPES OF MALOCCLUSION OF DECIDUOUS TEETH AND RESULTS OF ORTHODONTIC TREATMENT (CLINIC)*

By Dr. Leonard M. Gunton, New York City, N. Y.

THE object of this clinic is to show the necessity of early recognition of lack of development of the maxilla and mandible in deciduous dentures and also malocclusion when it exists, and the advisability of immediate steps to assist nature with the little stimulus necessary to produce growth and development along normal lines.

The types of malocclusion of the deciduous teeth are the same as found

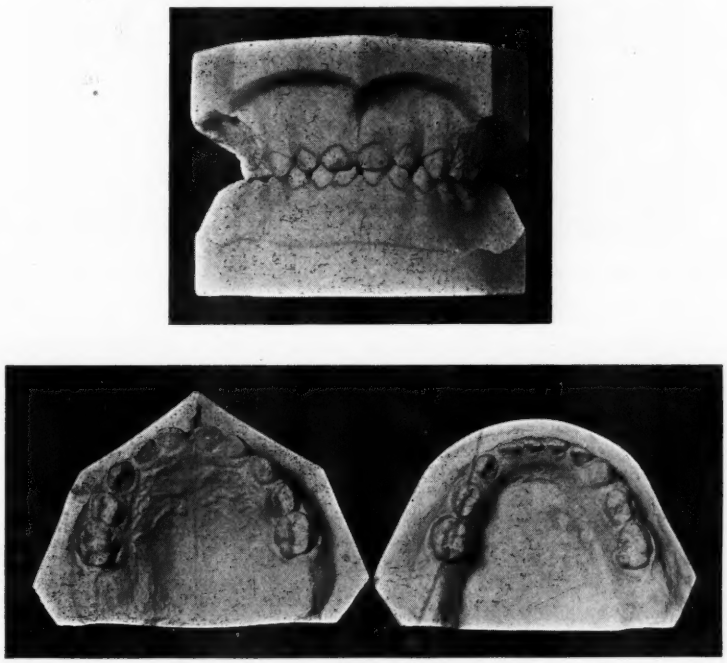


Fig. 1.—Shows a normal arch prior to the eruption of the first permanent molars.

in the permanent denture: mesioclusion, distoclusion, lack of anterior occlusion, inferior protrusion, etc., etc.

More particularly is this clinic made to draw attention to those cases where there seems to be an arrested growth of the mandible or maxilla, as indicated by a deep overbite, or of a lack of spacing of the deciduous teeth prior to the eruption of the permanent incisors, even though the teeth may, to casual observation, seem to be in good alignment.

It will be noticed in normally developing arches that space occurs between the deciduous incisors and canines prior to the eruption of the permanent teeth, which spacing will accommodate the larger incisors and canines when they take their place in the dental arch. It has been found that space required for the mandibular permanent incisors is approximately the meas-

*Given before the First International Orthodontic Congress.

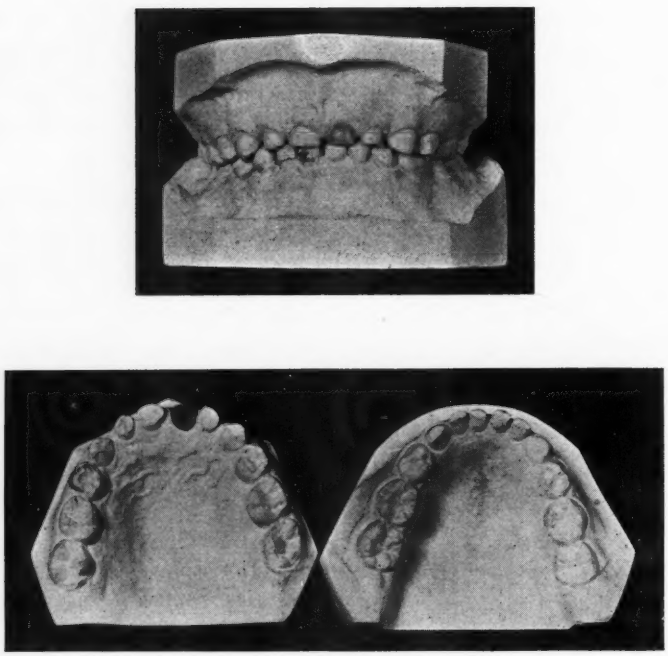


Fig. 2.—Shows a normal arch after eruption of the first permanent molars and just prior to the loss of the deciduous incisors.

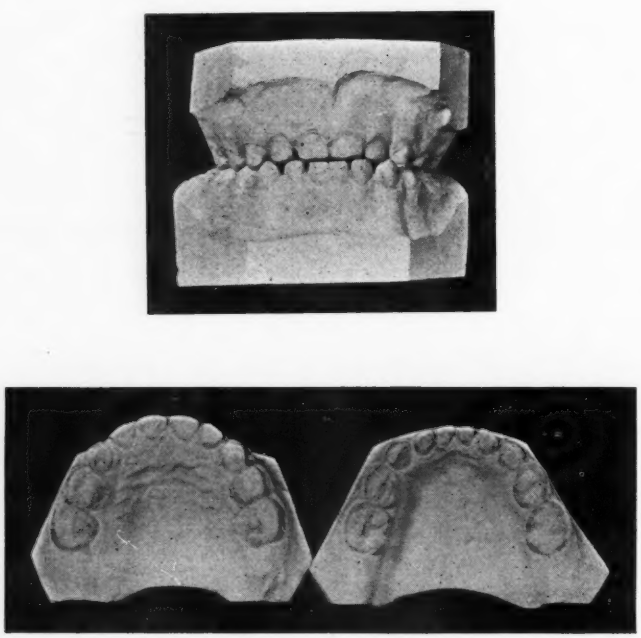


Fig. 3.—Shows spacing of incisors. Only requires observation.

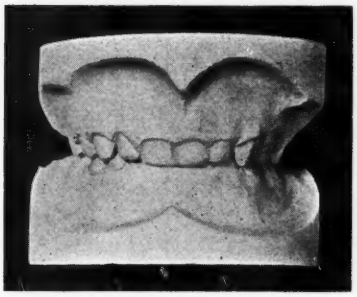
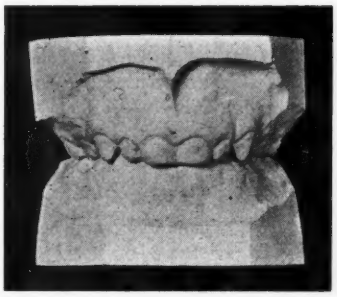


Fig. 4.—Shows deep overbite. Needs orthodontic assistance.



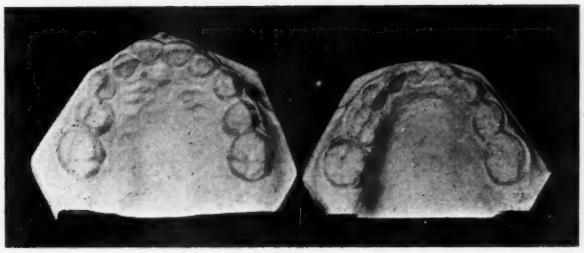


Fig. 5.—Shows deep overbite, mandible drifting distal to normal.

Fig. 6.

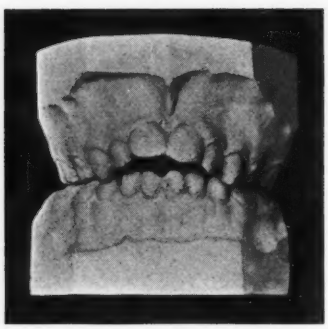


Fig. 7.

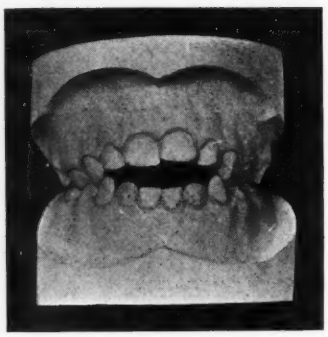


Fig. 8.

Figs. 6, 7, 8.—Show degrees of lack of anterior occlusion.

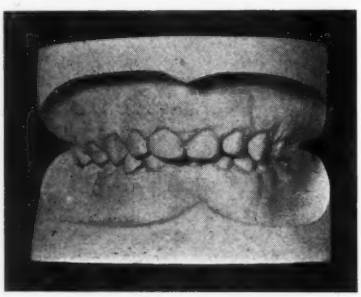


Fig. 9.—Shows lack of development, especially noticeable in mandible.

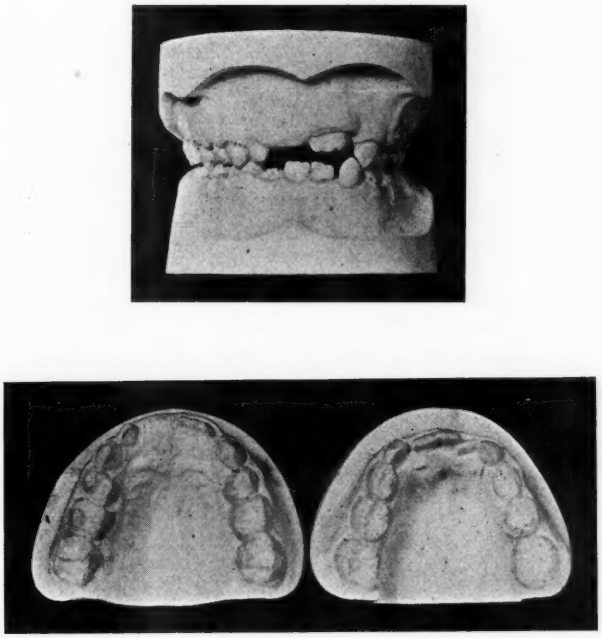


Fig. 10.—Shows lack of development of maxilla and mandible.

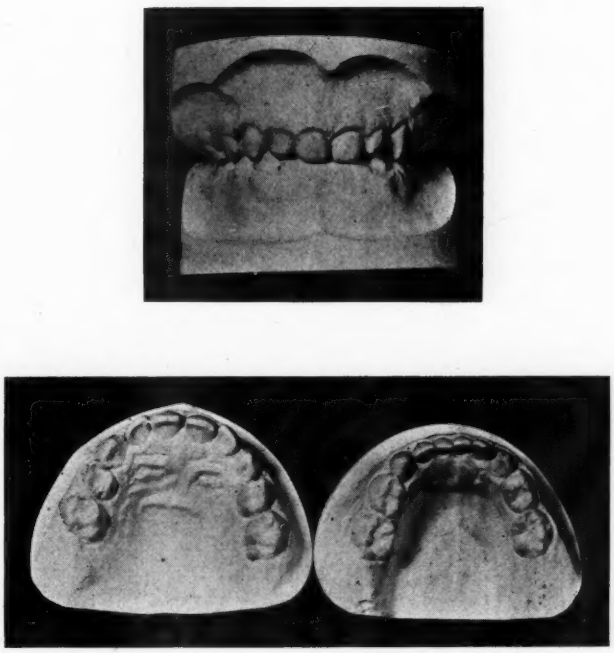


Fig. 11.—Shows arch needing orthodontic treatment.

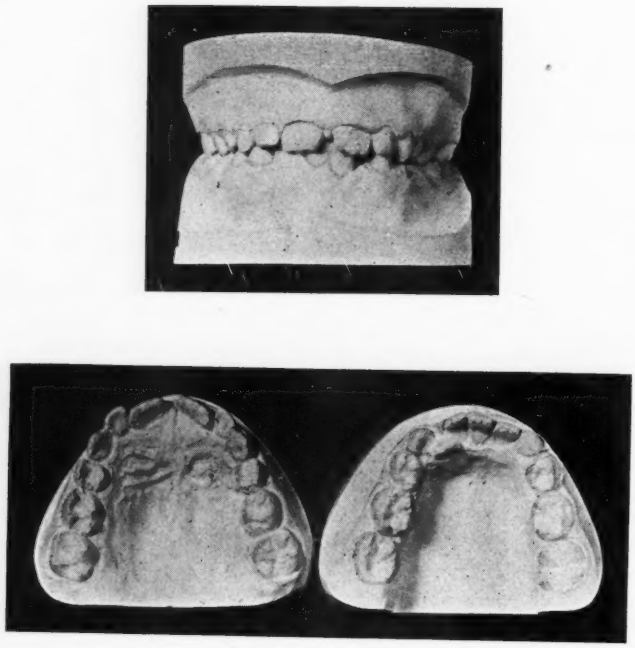


Fig. 12.—Shows arch in Fig. 11 sixteen months later, still needing orthodontic treatment.

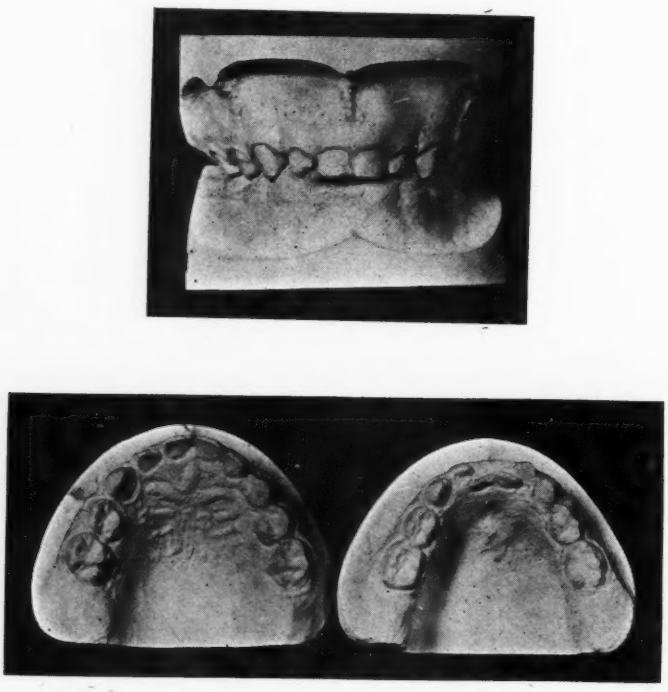


Fig. 13.—Shows arch needing orthodontic assistance.

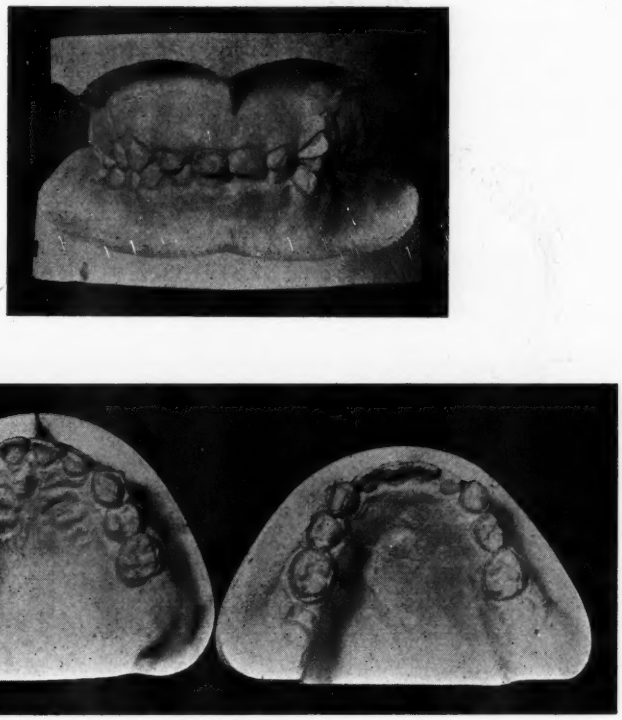


Fig. 14.—Shows arch in Fig. 13 after six months' treatment.

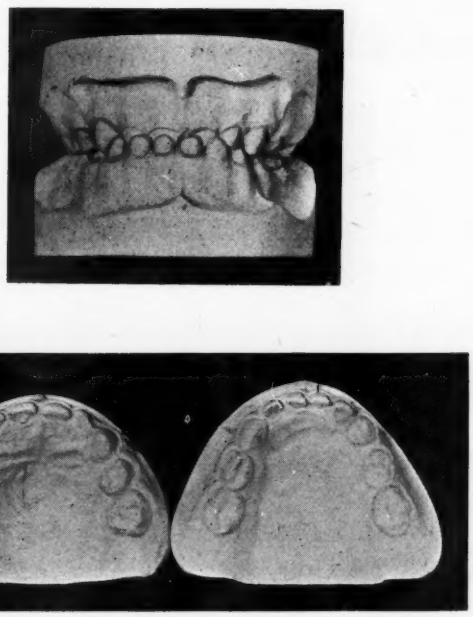
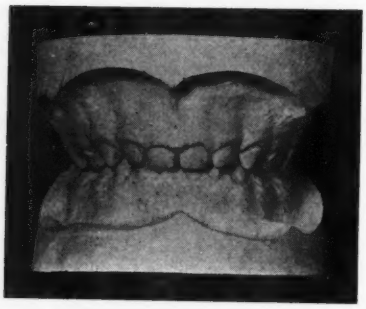


Fig. 15.—Shows maxillary incisors lingual to mandibular.



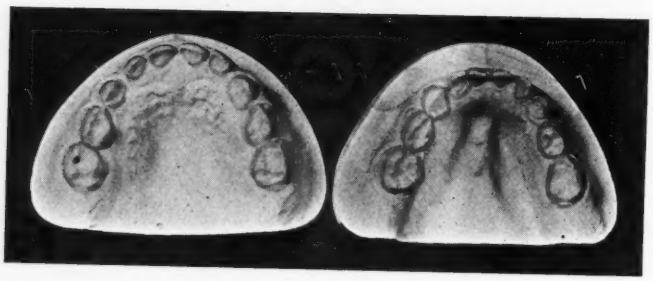
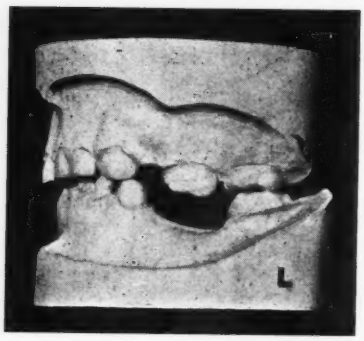
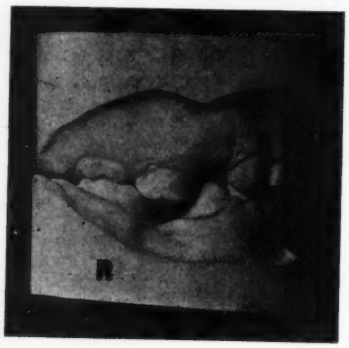
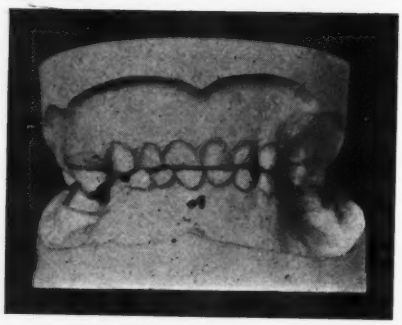


Fig. 16.—Shows Fig. 15 after five months' treatment.







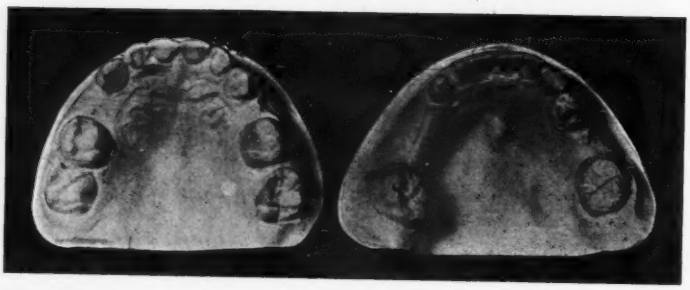


Fig. 17.—Shows result of extractions without space retentions.

ured distance from the mesial of the deciduous mandibular canine to the distal of the deciduous second molar. Of course after the eruption of one or two of the permanent mandibular incisors, the necessity for additional space can very easily be recognized by the dental practitioner, who has in his care, the child's teeth.

This spacing in varied degree accompanies all normal development of the jaws. In cases where this spacing does not occur, the tendency is to a deep overbite of the maxillary deciduous incisors, even though the mesiodistal relation of the molars and canines is normal. Later, a gradual drifting distally of the mandibular arch in relation to the maxillary will be noticed.

It is at the first appearance of this lack of development that the orthodontist should initiate treatment and stimulate growth of the maxilla or mandible that space may be obtained by the necessary expansion of the dental arches to accommodate the permanent larger teeth.

This expansion or growth having been accomplished, the case should be continued under observation until such time as the permanent teeth are in place.

A plea is therefore made for the early recognition of this lack of development of the arches containing the deciduous teeth and the necessary orthodontic stimulus, rather than a future and more prolonged treatment.

The accompanying photographs show cases and classes of malocclusion and also cases which have received treatment.

DEPARTMENT OF ORAL SURGERY, ORAL PATHOLOGY AND SURGICAL ORTHODONTIA

SOME OF THE IMPORTANT FEATURES OF DIAGNOSIS OF DISEASES OF THE MOUTH FOR THE GENERAL PRACTITIONERS OF DENTISTRY*

By Sterling V. Mead, D.D.S., Washington, D. C.

THE mouth is subject to practically as many types of disturbances as any other portion of the body and has many conditions peculiar to its own field. It is of the utmost importance that a correct diagnosis be made so that a prognosis can be given and the proper treatment instituted. While there may be various ways of treating the same disease, there can be but one true diagnosis. A thorough understanding of all of the diagnostic methods is essential for the successful treatment of any case. It is the duty of the dental surgeon to obtain full information from the patient regarding both local symptoms and disturbances and manifestations of general disturbances. The presence of oral sepsis and other mouth conditions which may affect the general health should be made known to the physician.

The examination of the mouth should not be made in a perfunctory manner, but a complete examination should be conducted in a routine manner. I have found the following method of procedure to be a good plan:

1. Complaint
2. History
3. Manifestations of pain
4. General oral examination
5. Percussion and palpation
6. Exploration
7. Color
8. Conductivity of temperature
9. Transillumination
10. Roentgenograms

*Read before the First District Dental Society of New York, January 7, 1929.

11. Pulp testing by electric current
12. Bacteriologic examination
13. Histopathologic examination
14. Blood examination
15. General physical condition, temperature, etc.
16. Urinalysis
17. Serologic test
18. Differential diagnosis
19. Treatment recommended

In the examination of the patient, while there is no doubt of the great value of the various laboratory methods, transillumination and other recognized methods of mouth examination, we must not forget that symptom diagnosis is still a very important factor. Many of the diseases of the mouth may be diagnosed from the standpoint of symptoms where other methods would fail. Therefore close attention should be paid to the complaint of the patient, the history of the patient, the manifestations of pain, etc. The history should consider heredity, use of drugs, previous or present history, general habits, etc.

The general oral examination should take into consideration oral sepsis, stomatitis, lesions, growths, defective restorations and proper care or neglect of the mouth, condition of the gums, saliva, etc.

By percussion and palpation one is sometimes able to detect pulpless teeth when no other symptom of disease is shown. By palpation over the apex of the tooth or around the tooth a definite area of soreness may be found. Swellings, growths or lesions of the mouth or enlarged lymph glands may often be detected by digital palpation.

All surfaces of the teeth should be carefully explored for caries. Fistulae and opening in the soft tissue should also be explored.

The color of the teeth is sometimes an indication of pathology. The color of the soft tissue is also an aid in the diagnosis of abnormal conditions.

Conductivity of temperature is valuable in the diagnosis of pulp disturbance. Hot and cold water may be put into the desired location with a hypodermic syringe. There are also numerous other ways of applying heat and cold.

While transillumination of the teeth and gums and mouth is generally used to some extent, I believe that the true value of this method is not well understood. I believe the manufacturers and others have attempted to create a wrong impression regarding its possibilities and that the failure to have these theories supported in their clinical experience has caused many men to abandon its use. Regardless of opinion of others I do not feel that transillumination shows bone pathology. I believe that transillumination shows soft tissue infection, and while there may also be bone pathology present, it is the soft tissue infection that causes the congestion and casts the shadow and not the bone pathology.

A full mouth roentgenographic examination is advisable in every case. I prefer to make a fifteen minute intraoral routine examination and supplement this with occlusal views, lateral extraoral views, anteroposterior views,

etc., where needed. It must be remembered that a roentgenogram shows changes in bone structure but not in the soft structure.

The diagnosis of pulp vitality by a vitality tester or electrical apparatus is of great value but is not of great value when not used in connection with the roentgenogram and other methods of diagnosis. The results obtained are often very misleading if one is not versed in this method.

The bacteriologic examination is necessary in many cases for the examination of sputum, saliva, periodontal involvements, the detection of Vincent's infection and as an aid in diagnosis of specific infection, septicemia, etc.

Histopathologic examination is sometimes necessary. It may be necessary to remove sections of growths for laboratory examination. While this is best done at the time of operation by frozen section method, it is sometimes impracticable, and it may be necessary to remove a section of the periphery for study, which is best done by electrothermic methods. The section should be placed in a 10 per cent formalin solution.

A blood examination is absolutely necessary in many cases and is of great value in all cases as a complete blood picture will often disclose pathology and is an aid in diagnosis of clotting and bleeding time. A knowledge of the blood pressure is very valuable when choosing the anesthetic.

There is an absolute necessity in many cases of having a complete physical examination of the patient and a knowledge of his various ailments so that his case may be handled in an intelligent way. The physical examination, of course, is in the field of the physician. However, there is one precaution often neglected by dentists: a thermometer will often save embarrassment. As an illustration, Mr. Morgan was referred by the Dentist for extraction of teeth because he was feeling badly. His temperature was taken and found to be 102° F. He was sent home to bed, and the next day his case proved to be intestinal influenza. Extraction would have been ill advised at the time.

The dental surgeon should make use of the stethoscope and sphygmomanometer as aids in the selection of the anesthetic to be used.

Urinalysis is also of great value.

A serologic examination is of special value not only as an aid in the diagnosis of the patient's condition but as a means of protection to the operator. It must be remembered that the Kahn test is indicative of syphilis in an earlier stage than the Wassermann and is rapidly supplanting the Wassermann in many localities.

While it is not practical in every case to have all of the results outlined here before one in making a differential diagnosis still it is the ideal way and in many cases the only way. This is one of the great advantages of group medicine and of group practice. In the differential diagnosis an analysis is made of all the various manifestations and of the various methods of diagnosis, and by the process of exclusion a final diagnosis or at least a presumptive diagnosis is made.

While it must be remembered that in such conditions as tumors, it is essential to make a diagnosis before operation, still in many cases this preoperative diagnosis is a presumptive diagnosis, as the results of the operation and the pathologic report may change the final diagnosis. In other words a growth may have the appearance of a myxomatous fibroma, cystic adaman-

tinoma or a giant cell tumor, and in some of these cases it is impossible to say definitely which of these conditions is present any more than to determine that the condition appears to be benign and one of the three conditions.

COOPERATION WITH SPECIALISTS AND THE MEDICAL PROFESSION

Many of the patients who come to the dentist are having some systemic disturbance; and in others while there is no systemic disturbance, there are local factors in the mouth that will evidently cause systemic disturbance. There should be a very close cooperation between the dentist and the physician. The dentist should stay well within his field and recognize the physician's interest and the general welfare of the patient and cooperate with him in every way possible. The physician cannot handle his problems well without the assistance of the dentist, and the dentist is very much dependent upon the physician for the knowledge of the patient's physical condition.

The general practitioner should also consider the advisability of referring extractions or surgical cases to the oral surgeon when he feels the patient will profit by this procedure.

He should also refer cases to the orthodontist and periodontist when indicated.

I think we should consider the advisability of a close cooperation also with the rhinologist, the general surgeon and other specialists in medicine. I feel that where the maxillary sinus is involved, the best results are obtained when the dentist clears his field and then cooperates with the rhinologist.

I think cooperation with the physician means more than expecting the physician to refer cases to the dentist. Local mouth conditions should be reported to the physician and patient sent for physical check up. The dentist may be the first to detect symptoms of systemic disturbances.

SOME OF THE COMMON MISTAKES OF THE DENTAL PROFESSION

I think that the most common mistake of the dental profession is the wide difference of opinion in regard to the interpretation of roentgenogram, the failure to recognize the value of all of the diagnostic aids, the willingness to do surgical and other work without knowing anything of the patient's general condition, condemnation of the work of others and attempting to do work which takes them beyond their field and which they cannot complete to the best interests of the patient. In many cases the general practitioner temporizes with dangerous conditions such as acute infections and growths, etc., not realizing their significance until the condition has reached an alarming stage.

There should be no difference of opinion regarding the roentgenographic interpretation. The film should be clear. The results of pathology should either be shown definitely or not be shown by the film or the condition may be questionable. The imagination should not be used. In many cases it may be necessary to have a number of views and even then the roentgenogram may not be of any real diagnostic value in some cases. In other words, the roentgenogram should be considered as a factor only in the field of diagnosis.

There should be a more standardized or better recognized basis for selection of pulpless teeth and periodontally diseased teeth which may be treated or retained.

One of the greatest mistakes of dentists is the failure in some instances to support their profession properly. A criticism of any kind does not help the patient or any of the interested parties and helps to lower the dental standing of the community.

There is a widespread lack of appreciation of the seriousness of dental conditions and dental operations among the medical profession and even among the dentists. The removal of a tooth is a more serious procedure than many of us realize. There is still a prevailing attitude that an injection of novocain, a little gas, pulling a tooth, etc., are of no real importance, although they are dreaded. Many people express surprise that infection, shock, or any complication should follow so simple a procedure as removing a tooth.

I have seen patients who successfully passed through dental operations die of other complications within a few days. Dentistry is more a part of the healing art today than ever before, and we are dealing with sick people. It is to be expected that some of these people will die, and the circumstances surrounding these fatalities and complications may throw suspicion upon the dentist and his work; although the cause may be foreign to his field, or even though in his field unavoidable.

There should be a united effort to educate everyone in the seriousness of dental operations, in the importance of diagnosis, cooperation with the physician, preoperative preparation and proper postoperative care.

Dentistry is making a mistake in not attempting more instruction of mouth diseases and dental problems to medical students, and endeavoring also to broaden the views of the general medical practitioner.

The general practitioner of dentistry may refer a case to the exodontist or oral surgeon, or the exodontist may refer a case to the surgeon or medical specialist, without a full knowledge of all of the difficulties and responsibility and may undertake to dictate a plan of procedure. A case that is referred should be turned over with full confidence that the case will be handled correctly as the operator thinks best.

There is a general habit of doing dental operations, extractions or even other surgical procedures without proper preliminary mouth prophylaxis and hygiene.

There is a widespread willingness to operate in the mouth without preoperative and postoperative roentgenograms.

Serious results may often be prevented by preoperative recognition of dangerous conditions through physical examination, and by handling the so-called simple case as a major operation.

The more one undertakes to treat and handle serious cases, the more responsibility one must assume.

WHAT THE GENERAL PRACTITIONER SHOULD KNOW REGARDING THE DISEASES OF THE MOUTH

The general practitioner should be able to make a routine mouth examination, and he should know the entire field of his work. Where his particular type of work does not enable him to see enough of the cases of stomatitis, tumors, and unusual conditions, he should be able to determine where to send the patient for further examination.

We might say the health of the patient is often in the hands of the general practitioner of dentistry, and he may have the best opportunity for safeguarding the patient's health. He must therefore have a generalized knowledge of diseases of the mouth, their seriousness, proper diagnostic procedures, proper cooperation and consultation, and he should look at the patient's mouth not only from the restorative standpoint, but from the standpoint of one of the consultants in the care of the patient's general health.

Indication and Contraindication for Extraction.—Each operator must determine for himself what teeth he can treat successfully but should be guided by the work of more experienced and skillful operators. As a protection to himself and the patient he must effect a large percentage of cures and not occasional successes. This applies to periodontal as well as periapical diseases. I feel confident that I have seen many pulpless teeth in the mouths of patients for years without any local or general symptoms of trouble.

I believe that treatment through the root canal or apiectomy is successful in selected cases. The chance of success in root canal work is in direct proportion to the extent of tissue destruction, number of roots, and accessibility of canals. The most favorable cases are those in which the vital pulp has been aseptically extirpated and the root canal immediately filled. When the pulp undergoes decomposition, the chances decrease, and when periapical disease is established, treatment is then very questionable. There is some hope if there is no bone pathology, but when there is definite osteitis, treatment is practically useless.

One of the bad features of the pulpless tooth problem is the fact that when one examines a mouth and finds no periapical pathology about pulpless teeth and has occasion to see this same case later (from a month to a matter of years), he often finds definite pathology. Pulpless teeth do not always remain constant, but the condition may change, and I therefore advise periodic examination of them, if retained.

Pulpless Teeth.—In determining when to extract a pulpless tooth, it is necessary to take into consideration many factors. Each case should be handled as good judgment and experience indicate, and with but very few exceptions, my practice is to recommend extraction of:

1. All teeth showing evidence of periapical bone involvement.
2. All pulpless teeth in patients whose health is seriously endangered.
3. All pulpless teeth showing marked periodontal bone resorption (periodontoclasia).
4. All pulpless teeth directly bordering on the maxillary sinus.
5. All third molars when pulpless.
6. All pulpless teeth when the root formation precludes the possibility of a good root filling.
7. All pulpless deciduous teeth.

I think that pulpless teeth with satisfactory root fillings, whose periapical tissues are roentgenographically normal, where transillumination, ocular and digital examinations are negative, and symptom diagnosis negative, may safely be retained, but they should be kept under observation from time to time.

Periodontal Disease.—Prognosis: Periodontal disease may be classified for treatment as follows:

Class I. Gingivitis. No bone resorption; no pocket.

Class II. Slight bone resorption and pocket.

Class III. Bone resorption of marked degree, but involving less than half the length of the root of the tooth.

Class IV. Bone resorption, extending more than half the length of the root of the tooth.

The prognosis for Classes I and II is very favorable. The prognosis for Class III is usually favorable for vital teeth. The prognosis for Class IV is usually bad, and extraction is usually indicated.

Other factors affecting the prognosis are:

1. It is necessary to have the cooperation of the patient in prophylaxis.
2. The patient's general condition must receive proper and careful attention, and vitality of the tissues must be restored.
3. All forms of mouth sepsis should be corrected and pulpless teeth removed when they are infected.
4. Where occlusion is bad and cannot be corrected, the prognosis is not good.
5. Teeth with good proximal support are more favorable for treatment.

Diseased Pulp.—The pulp may be diseased without periapical symptoms, and even though partially vital, the tooth should be removed if it cannot be successfully treated.

Unerupted or Impacted Teeth.—Teeth embedded in normal bone structures should not be removed simply because of this condition, unless there is good reason to suspect them of reflex irritation or systemic disturbances. There are some cases where these teeth are removed upon symptom diagnosis in the absence of any other sign of disturbance, and recovery follows. It is sometimes advisable to remove these teeth when they endanger adjacent teeth.

Where there is pericoronal or other bone resorption surrounding these teeth, giving evidence of pathologic changes, they should be removed.

Where there is infection or irritation of surrounding soft structures, these teeth should be removed at the proper time.

Roots.—Embedded roots should be extracted in every case, as they will sooner or later be the site of chronic osteomyelitis or an acute infection. The only contraindication for removal of roots is where the age, health of patient or position of root may lead to more harmful complications.

Other Conditions.—Teeth causing or involved in cysts or tumors should be removed.

Teeth which interfere with proper articulation, those which cannot be properly restored, and those which interfere with restorations should be removed.

Supernumerary teeth should be removed.

Temporary teeth retained beyond their proper time of exfoliation should be removed unless they have no permanent teeth beneath them.

The following conditions usually contraindicate extraction unless previously controlled: diabetes, syphilis, severe anemia, leucemia, hemophilia, severe heart trouble, lowered resistance, fever, sore throat, purpura, etc.

Acute Infections.—The danger of extraction during an acute bone disease is the possibility of septicemia or cellulitis. When the removal of a tooth is indicated during an acute bone disease, in order to obtain drainage, I would remove it.

Immediately after surgical work where there is extensive infection or trauma, cold applications should be applied. Where swelling occurs, I prefer a saturated solution of magnesium sulphate on unbroken surfaces or Burroughs aluminum acetate in infected raw surfaces. Where the swelling persists after twenty-four hours, I usually prefer to change to alternating hot and cold magnesium sulphate packs and continue over a twelve hour period, using hot but a few minutes at a time. If swelling still continues, I then use continuous hot solution to endeavor to abort the condition or localize the pus.

When the localization is at or far below the angle of the mandible, extra-oral incision is usually indicated.

It is not well to extract teeth during acute involvement if the infection can be controlled by hot saline mouth wash and cold packs to face, or by incicision and drainage. Where the removal of a tooth is the best drainage for the pus, it should be removed, if this can be accomplished without too much traumatism. The lower third molar is especially dangerous during acute involvement, and this can usually best be controlled by treatment and removing tooth after the acute condition subsides. It is well to irrigate under the flap of tissue and apply a mild antiseptic drug upon a piece of cotton under the flap. The case should be seen as often as indicated.

There can be no standardized method of handling acute infections, as they differ, but each case must be handled according to the problems presented.

Many cases of adenitis and cellulitis may be prevented by careful post-operative observation, palpating the periosteum and tissues, and letting out congested blood or lancing the buccal mucous membrane where necessary.

I believe in early incision in most acute infections except in the region of the upper lip, where the pus should be allowed to localize on account of the danger of cavernous sinus thrombosis.

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MAXILLOFACIAL PROSTHESIS*

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(Continued from page 177, February issue.)

Intraoral Restorations

THE construction of artificial restorations within the mouth in maxillofacial cases has been aptly described as denture prosthesis with complications. The restoration of missing teeth forms a part, but only a part, of the work; in addition to the teeth, the adjacent osseous structures must be restored, sometimes including those within the nasal cavity as well.

The chief difference between maxillofacial cases and every day denture prosthesis lies in the amount of tissue which has been lost. Following extraction of the teeth absorption of the ridges reduces their height in an average amount approximately equal to one-half the length of the tooth roots; whereas gunshot wounds frequently result in a loss greater than the entire length of the tooth roots. This excessive loss of tissue introduces new problems of leverage and anchorage, necessitating extreme care in the designing of the restorations. Such injuries are also frequently confined to one side of the face, causing a unilateral loss of teeth and tissue, which presents further difficulties in design.

The scar tissue which results from the injury offers an entirely different foundation for a denture base from that afforded by the normal edentulous ridges. Instead of a dense mucosa from one to three millimeters in thickness this scar tissue may be many times that thickness, and this mass of fairly dense but still yielding tissue renders the construction of stable dentures quite difficult.

Bone-grafts beneath this scar tissue are an additional complication when they are present. Even though the bone-graft restores the external contour of the face perfectly, it is seldom in the exact position with relation to the teeth that the normal ridge should occupy, and this makes it difficult to avoid a tipping or rocking of the denture when stress is applied to it.

In the maxillary arch, probably the most frequent complications are perforations through the hard palate. These add difficulty to the impression taking and to the securing of a stable foundation for the denture base. In partially edentulous cases the retention of the denture may not be seriously interfered with, but in wholly edentulous cases the problem of retention may offer well-nigh insuperable difficulties.

Wounds of the cheeks occasionally result in bands of scar tissue which are attached to both upper and lower ridges and which are stretched taut upon the opening of the jaws to any considerable extent. The inelastic

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nature of these scar bands renders them formidable obstacles to the secure retention of dental restorations. While this condition may be relieved to some extent by surgery, especially if the scar bands have their attachment near the crest of the ridge, it is not always possible to relieve it entirely, and it remains a problem of impression technic chiefly.

Fig. 85-*A*.—The excessive loss of alveolus resulting from a gun-shot wound.

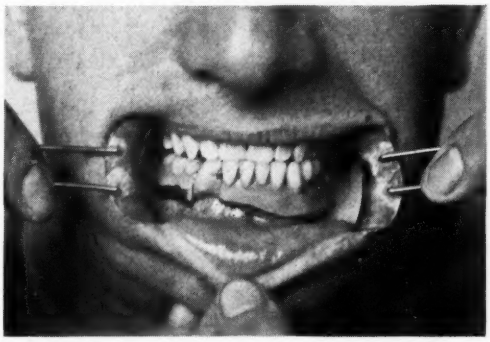

Fig. 85-*B*.—The denture in position. The few teeth are retained because of the unfavorable ridge conditions for full denture.

Fig. 86.—An anterior restoration illustrating excessive loss of alveolus. This denture was returned to the Walter Reed Dental Laboratory on March 2, 1929, for repair of the vulcanite attachment of the clasp, after being worn for nine years.

Following an operation for the detachment of adhesions of the labial or buccal tissues to the alveolar ridges and the creation of an artificial sulcus lined with an epithelial inlay, the denture flange must be so shaped as to preserve the space thus gained and to prevent contraction of the tissues.

This condition also presents a problem in impression taking in order that the restoration may take full advantage of the artificial sulcus without causing undue irritation.

IMPRESSION TECHNIC

In all of these conditions I believe that the sectional compound impression technic is far superior to any plaster impression technic that has been

Fig. 87.—The denture in position.

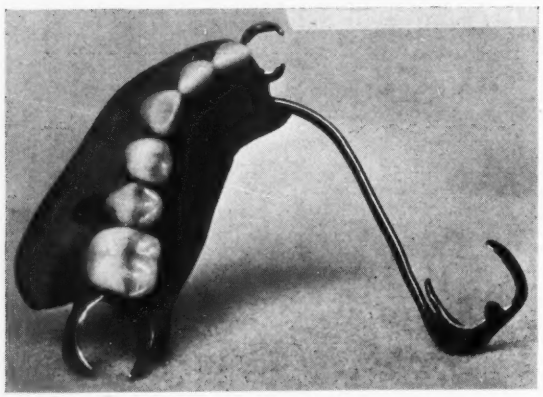

Fig. 88.—A prosthesis illustrating the unilateral appliances frequently needed.

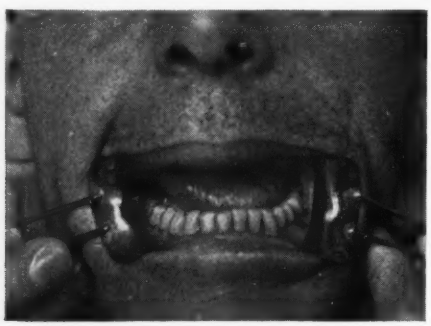

Fig. 89.—The denture in position.

offered to the profession. Indeed I cannot conceive how many of the more difficult cases could be handled with plaster as the impression material.

Compound first of all permits the taking of impressions in as small and numerous sections as would be needed in any case of microstomia. It allows tissue compression or placement to secure uniform bearing of the restoration on both hard and soft tissue under stress; and with the scar tissues so fre-

quently encountered, this is not an abstract or theoretic proposition. Compound permits extensive muscle trimming of the peripheries of the impression and its moulding to any required fullness to restore facial contour at the same time. In cases involving the upper lips, where the building out of the facial flanges to normal contour would result in a shortening of the lip and where a compromise must be effected, this is a most valuable attribute.

Small areas of the impression may be reheated and conformed as desired to adapt it to special conditions. For instance, relief may be afforded to the scar bands mentioned above by reheating the impression over the area

Fig. 90.—Illustrating the scar-tissue base resulting from a gun-shot injury and consequent bone-graft. The labial sulcus is almost obliterated, and only the right second and third molars remain in the mandibular arch.

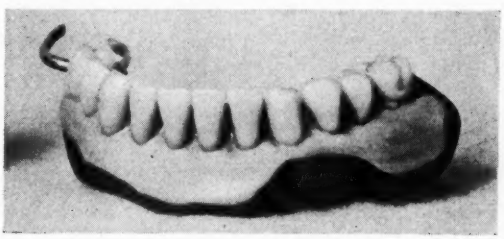

Fig. 91.—The prosthesis. The ridge conditions were so unfavorable for a full lower denture that the use of the remaining teeth for retention was imperative.

of their attachments and allowing the bands to trim their own path through the soft compound by the widest opening movement indicated.

Additions may be made to the impression wherever needed. This is especially valuable when taking impressions of cases with palatal perforations, as the impression can be started with a minimum amount of material and such additions made as are indicated, thus avoiding the forcing of excess impression material through the perforation.

The following technic for taking impressions of maxillofacial cases is based on the original Green-Supplee technic. The closed-mouth technic is used because it permits the esthetic requirements of the case to be satisfied at the time the impression is taken.

Use an aluminum tray of the Supplee or Kennedy type, with only slight facial flanges and a small anterior projection to serve for a handle. Adapt the tray by placing it between the teeth and having the patient close firmly upon it. See that the tray does not impinge upon soft tissue in any part, and allow it to extend approximately three millimeters beyond the facial surfaces of the teeth.

Fig. 92.—A palatal perforation resulting from a gun-shot wound.

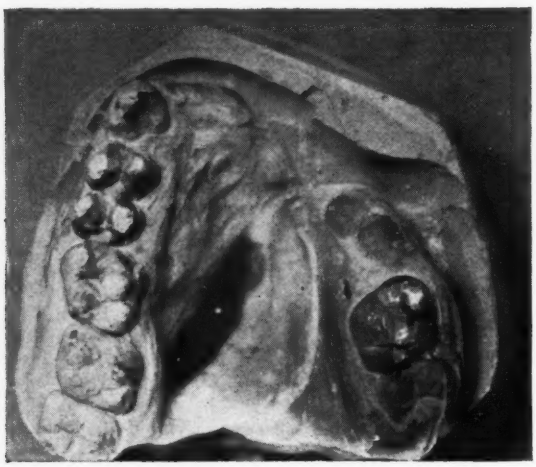

Fig. 93.—A palatal perforation and excessive loss of alveolus in the anterior region.

Place upon this tray the amount of compound needed for the imprint of the saddle areas and the lingual surfaces of the teeth only, shaping it to such form that no compound will cover the facial surfaces of the teeth. After flaming the surface and tampering in water at 145° F. Insert it in the mouth and instruct the patient to close very slowly. The impression is pressed to place by the antagonizing teeth, not by the operator. When the patient has closed to a point where the teeth are five millimeters from the tray, in-

struct the patient to open. When chilled, remove and trim off the excess compound on the facial surfaces, on the distal portion of the maxilla and the lingual flange of the mandible. The mandibular lingual flange should be thinned to three millimeters.

This procedure produces a matrix or compound tray in which the actual impression is taken. Any deficiencies are corrected at this time when it is not necessary to use as much care as when attempting to correct a finished impression. In cases with extensive loss of substance additional compound should be added to the desired extent.

Fig. 94.—A palatal perforation resulting from necrosis following extraction.

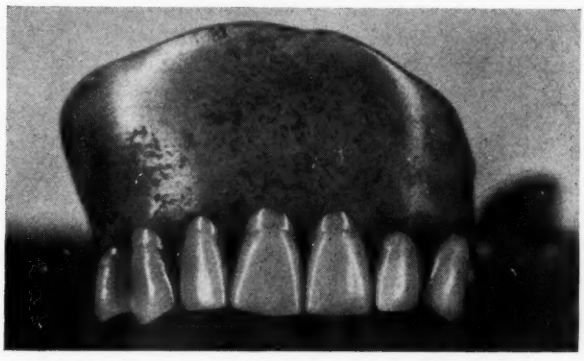

Fig. 95.—The prosthesis, showing the amount of tissue lost.

When the matrix will satisfactorily cover all the necessary area, always excepting the facial surfaces of the teeth, it is ready for the final impression. Heat the inner surfaces of the matrix to a flowing consistency with a mouth blowpipe to a depth of two millimeters. Temper, replace in the mouth and instruct the patient to close firmly, using full biting stress. The muscle trimming of the facial flanges can be done at this time, by massaging over their peripheries. If only slight undercuts are present, the impression may then be chilled and removed.

If extensive undercuts are involved, the impression should be removed by successively lifting and replacing it while the compound is in the mould-

ing stage, increasing the distances each time until you are sure it can be removed. Then replace and chill while the patient is holding it in place by biting stress. This technic has been described in detail by Dr. Kennedy in his book on "Partial Denture Prosthesis" with the exceptions that he advocates an open mouth technic and that he prepares the matrix impression upon a study model prepared previously.

Trim the impression margins to a sharp edge at right angles to the tooth surfaces, trimming at the approximofacial angle of the teeth in order

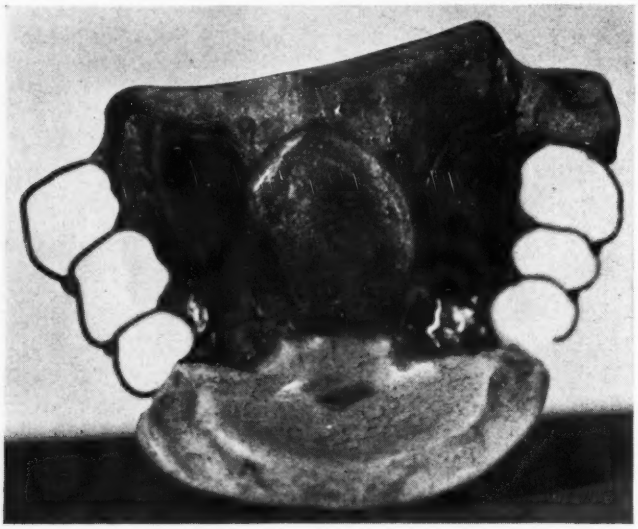

Fig. 96.—Palatal aspect of the prosthesis. Jackson crib clasps were used to distribute the stress over all the remaining teeth.

Fig. 97.—The prosthesis in position.

to expose completely the facial surfaces of the teeth, and allowing the impression to extend over the incisal or occlusal surfaces onto the facial surfaces for approximately one millimeter. Return the impression to the mouth, test it for rocking or over-extension, and then adapt the face-piece over the facial surfaces of the teeth while the patient holds the impression firmly in contact with the tissues by biting pressure. The face-piece may be made in as many sections as necessary in order to withdraw it without distortion.

If excessive loss of tissue is the only complication which is present, this procedure will give a satisfactory impression, and a stone model from this impression will permit the construction of an assembled restoration without further operations in the mouth other than trial for the esthetics of the tooth arrangement. If additional complications are involved, further steps will be indicated.

If the saddle area which is available for the denture foundation is composed of a large amount of yielding scar tissue, such as would be found in

Fig. 98.—A palatal perforation resulting from a gun-shot wound.

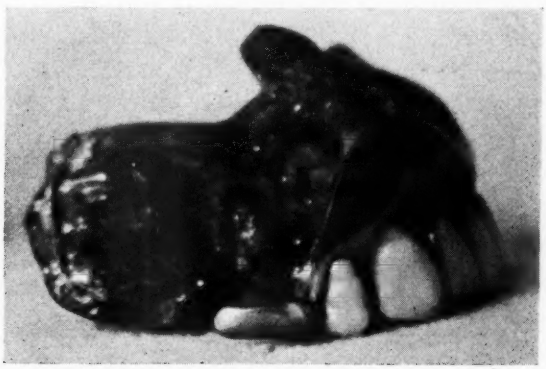

Fig. 99.—The prosthesis, showing the relation of the teeth to the osseous foundation.

the region of a bone-graft, the impression should be rebased over that area by adding one or more thicknesses of impression compound wafers, flaming the added compound and the neighboring impression surface, and reinserting the tray under full biting stress, maintaining the pressure until the teeth are accurately seated in the unsoftened portions of the impression compound. The amount of tissue compression can be varied to suit the case by altering the temperature of the water in the compound heater. Varying this temperature from 120° to 145° F. will give a decided variation in the plasticity of the material with resultant increase or decrease in the stress placed on

the soft tissue. By following this procedure the soft areas can be made to support their share of the masticatory stresses, and the rocking of the denture under these stresses will be considerably reduced. Muscle trimming of the periphery of this area is best done as a separate and subsequent step.

If bands of scar tissue are attached between the upper and lower ridges which tend to lift the impression when the mouth is opened wide, provision

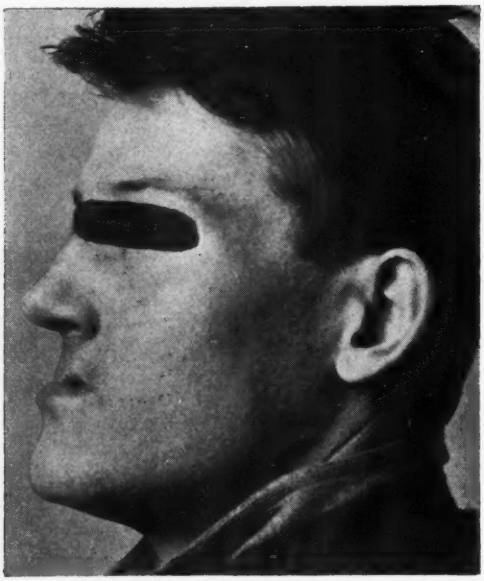

Fig. 100.—The loss of tissue permitted the upper lip to contract to the position shown.

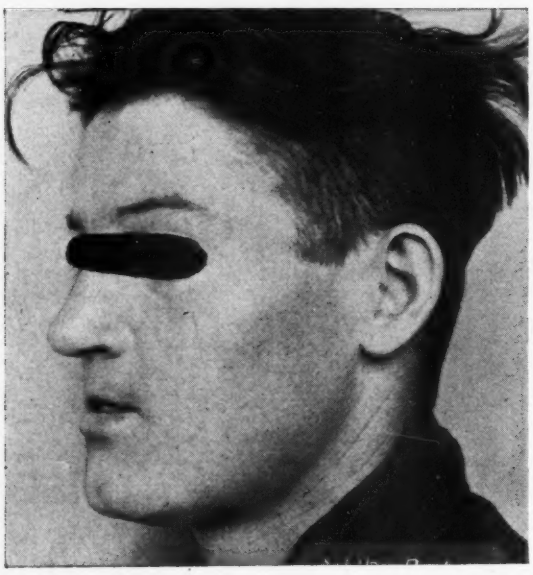

Fig. 101.—The prosthesis in position. Building out the lip anteriorly resulted in a shortening of the lip, and a compromise was necessary.

Fig. 102.—Labial view of the prosthesis in position.

can be made for their action by reheating the part of the impression flange upon which they impinge and repeating the opening movements with the impression firmly held in place by finger pressure. This operation can be repeated until perfect freedom from interference is obtained.

In cases with perforations of the palate, either into the nares or the maxillary sinus, it is best to start the matrix impression with a comparatively small amount of compound, so that no material will be forced into the perforation. By then adding small amounts of compound to this matrix impression where desired, the impression can be gradually built up to the necessary contour without pain or discomfort to the patient and without distorting the impression. In some cases the impression will be finished flush with the palatal margin of the perforation, and in other cases it will be desirable to build it to the level of the floor of the nares.

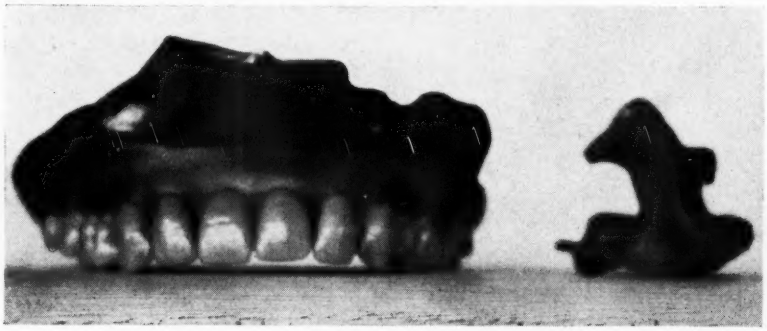

Fig. 103.—Prosthesis for an edentulous maxilla with a perforation into the nares and loss of the columella, constructed in two sections.

Fig. 104.—The prosthesis assembled. The two sections are attached by means of a Gilmore attachment.

When the matrix impression has been finally shaped to the proper contour, reheat the inner surface with the mouth blowpipe and reinsert for the finished impression.

DESIGN

The complications which have been enumerated above cause an increase in the leverage and stresses applied to the remaining natural teeth in partially edentulous cases and as a result require more than ordinary care in the design of the replacements. In the war injuries and in many of the peace time injuries the patients are young and active and will be required to wear some sort of an appliance for many years. In most of the cases, full dentures would be contraindicated because of the poor retention which would be

afforded by the foundation which is present, so the problem is to design a restoration which will do the least possible damage to the natural teeth, even at a slight sacrifice, sometimes, of function. Stresses should be distributed among as many teeth as possible, and mutilation of any remaining teeth for temporary stability should be avoided.

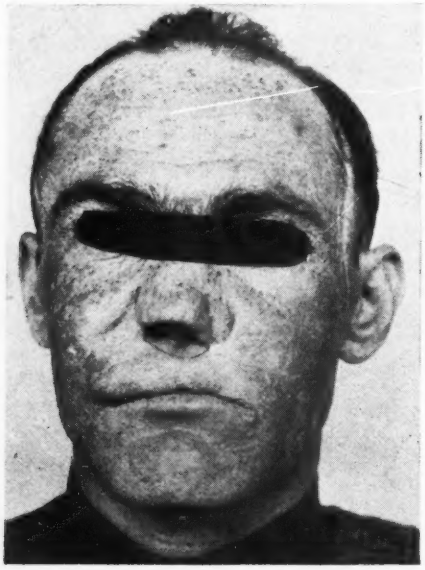

Fig. 105.—The prosthesis in position. The nasal portion is inserted through the nose and when attached to the intraoral portion serves for its retention.

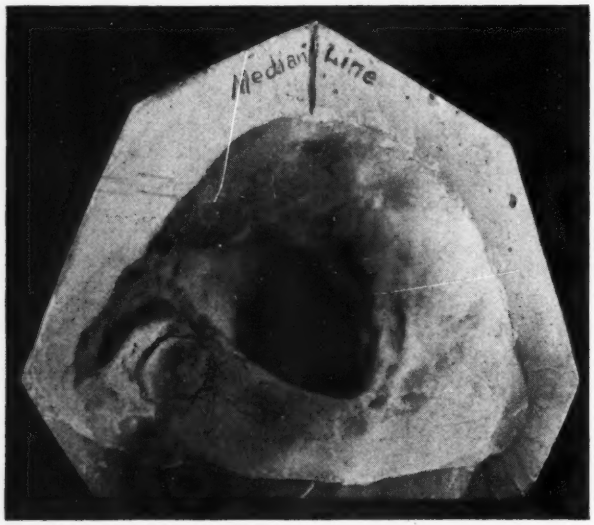

Fig. 106.—An edentulous case with complete loss of the maxillary bones and a palatal perforation. Only a mass of scar tissue is available for a foundation for a denture.

Without entering into a discussion of the various types of cast clasps, matrix clasps, stress-breaking attachments and so forth, it is believed that the light, resilient round wire clasp will do less damage to the teeth than any other form of anchorage. Its flexibility permits sufficient movement of the denture to care for the masticatory impacts without transmitting undue strain or torque to the teeth, and its minimum of tooth contact does the least damage to the tooth surfaces.

For anchorage to the teeth which are adjacent to the saddles the Gillette clasp, which introduces the additional resilience of the tortional effect, is very satisfactory. Constructed of a good grade of clasp gold wire of 18 gauge it furnishes ample grip upon the tooth for stabilization.

For remote anchorage, or attachment to a tooth or to several teeth at a distance from the saddle area, the Jackson crib clasp is favored over any of the more complicated, so-called precision attachments. Its delicacy and resilience furnish sufficient anchorage for the appliance without undue stresses being transmitted to the teeth.

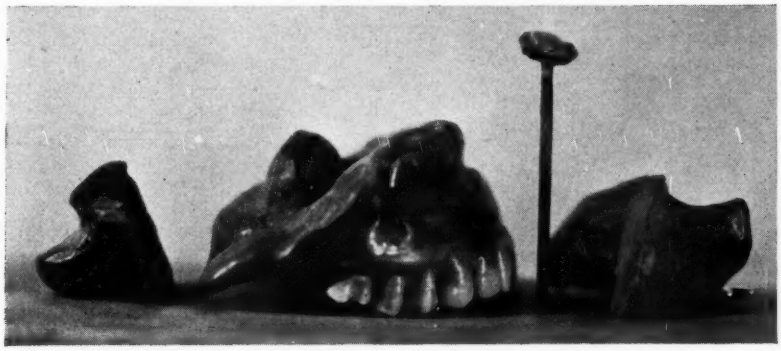

Fig. 107.—The prosthesis. Since retention by atmospheric pressure was impossible, advantage was taken of the margins of the perforation.

Fig. 108.—The prosthesis assembled. The sections were inserted individually and locked together by the long pin. The extensions into the nasal cavity served to retain the appliance.

Few cases which are extensive enough to be classified as maxillofacial restorations will have a sufficient number of teeth remaining in the mouth to support the appliance without the assistance of the mucosa, so the question of the occlusal rest on the teeth adjacent to the saddle area must be given careful consideration. If the mucosa in the immediate vicinity of the abutment tooth offers normal resistance to stress, the occlusal rest may be used; but if there is a large amount of yielding tissue and the number of missing

teeth is too great for tooth support, it is better to omit the occlusal rest even at the expense of temporary stability. This is a problem which has many angles, and no definite rules can be laid down. Each case must be studied by itself and that design adopted which will make for the longest life of the abutment teeth.

The fully edentulous maxillofacial case may present well-nigh insuperable difficulties, calling for the utmost ingenuity in the designing of a restoration. Excessive loss of tissue, scar tissue base and scar bands are all factors which render satisfactory full dentures difficult to construct. Full advantage must be taken of any undercuts, even though they are outside the usual field, and the base of the denture must be extended over as large

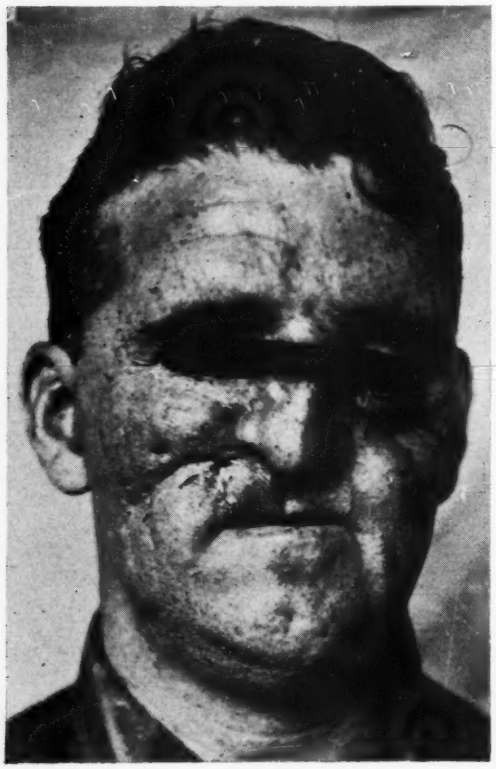

Fig. 109.

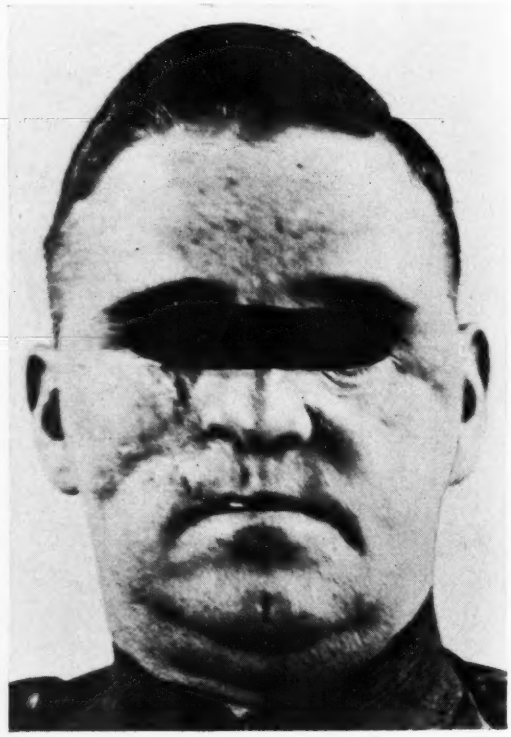

Fig. 110.

Fig. 109.—The patient without the prosthesis showing the collapse of the upper lip and dropping of the tip of the nose.

Fig. 110.—The patient with the prosthesis in position. This appliance was for esthetics only.

an area as possible. In many cases a functioning restoration is without the realm of possibility, and an appliance to satisfy the esthetic requirements only is all that is possible.

In maxillary cases with palatal perforations, the retention of the denture by means of atmospheric pressure is an impossibility and recourse must be had to some form of mechanical retention. In the two cases shown in Figs. 109 and 110 it was possible to secure sufficient anchorage within the nasal cavity itself to support the denture. These appliances were for esthetics only, however, since the maxillary bone was entirely lost in each instance, and the resulting mass of scar tissue was entirely inadequate to support mastication.

Many of the European prosthodontists have illustrated cases in which springs were used for retention in edentulous cases, similar to those shown in our early American textbooks of prosthetic dentistry. The author has had no experience with this type of retaining appliance, but it is conceivable that as a last resort they might be used.

NOTE.—This is the fifth of a series of articles by Captain Bodine, the sixth and last will appear in an early issue.

MERCUROCHROME AND IODINE AS DISINFECTANTS OF MUCOUS MEMBRANE OF MOUTH

PRELIMINARY REPORT ON RELATIVE EFFECTIVENESS*

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THE experiments here reported were undertaken with a view of ascertaining the relative efficiency of mercurochrome (especially the 2 per cent aqueous solution) and iodine solutions as disinfectants of the surface of the mucous membranes of the mouth. A further reason has been the general popularity of mercurochrome as a substitute for iodine in preoperative sterilization and for various therapeutic purposes within the oral cavity. Interest in this matter was aroused, indirectly, by the reports of Tinker and Sutton[1] in 1925 and 1926, and of Scott and Hill[2] in 1927, and by a very comprehensive report by Simmons[3] in 1928, all of whom have tested the relative bactericidal action of various mercurochrome solutions and other antiseptics, particularly iodine, from the standpoint of skin disinfection. Tinker and Sutton experimented with a 5 per cent solution of mercurochrome in 50 per cent alcohol, and a 5 per cent alcoholic iodine solution, and concluded that this mercurochrome solution was feebly germicidal against some of the common pathogenic bacteria and that iodine did not have any germicidal action against *Streptococcus hemolyticus* in blood broth. Scott and Hill are of the opinion that the aqueous mercurochrome solutions, in strengths of from 1 to 10 per cent, lack a number of the essential properties of an ideal skin disinfectant and suggest the use of an alcohol-acetone-mercurochrome solution. They assert that with this solution better skin sterilization is obtained than with iodine. Simmons' report is, in certain respects, very much at variance with the experiments of these authors. His conclusions, based on a most thorough study of the whole question involved, are to the effect that although both of the mercurochrome solutions suggested have a decidedly marked germicidal value when compared with mercurochrome-220 soluble (2 per cent aqueous), neither of these prepa-

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*From the Dental Section, Department of Preventive Medicine and Clinical Pathology, Army Medical School.

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*Part of a general study of antiseptics undertaken by the Bacteriological Department, Army Medical School, at the request of the medical supply division of the army. This particular study was done at the suggestion and with the cooperation of Major James S. Simmons, M. C., U. S. Army, in charge of the general investigation.

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rations has the potency of either the tincture or the 3.5 per cent solution of iodine as a disinfectant of unbroken skin surfaces. His contention, based on varied observations both in vitro and on the skin of animals, is that although iodine is far from being the ideal disinfectant, it possesses germicidal qualities superior to those of any of the mercurochrome solutions so far recommended.

The germicidal action of mercurochrome-220 soluble (2 per cent aqueous) in infections of the oral mucous membrane and the teeth has been claimed by Young, White and Swartz,[4] who took as a basis for their statements the report of Darnall,[5] who tried it out clinically in certain types of gingivitis and root canal infections. However, no comparative bactericidal tests on oral mucosa disinfection were submitted. The fact that mercurochrome-220 soluble is today the disinfectant of choice among a large group of oral surgeons and dental practitioners raises the question whether there is, in fact, a proper justification for the elimination of iodine from this field. Moreover, in the realm of modern nerve-block anesthesia by the intraoral route this matter is, obviously, of the greatest importance.

MATERIALS AND METHODS

The antiseptics used in these tests were the following: 1. Mercurochrome-220 soluble (dibromoxymercurifluorescein), a commercial preparation sold generally and labeled "For use as a general antiseptic in place of iodine." This antiseptic is a 2 per cent aqueous solution of mercurochrome and is so designated in the rest of this article. 2. Mercurochrome, 5 per cent, in 50 per cent alcohol. 3. Mercurochrome-alcohol-acetone solution. This is prepared by dissolving 2 gm. of mercurochrome in 35 c.c. of water and adding 55 c.c. of 95 per cent alcohol and 10 c.c. of acetone. 4. Alcohol-acetone solution, which consists of alcohol, 95 per cent, 55 c.c.; distilled water, 25 c.c.; acetone, 10 c.c. 5. Iodine-glycerin, 3.5 per cent, made up of equal parts of tincture of iodine, U. S. P., and chemically pure glycerin. 6. Iodine-glycerin, 1.75 per cent, consisting of iodine solution in the proportion of one fourth of the tincture and three fourths of the chemically pure glycerin. 7. Iodine-glycerin, 0.875 per cent, made up of iodine solution in the proportion of one eighth of the tincture and seven eighths of chemically pure glycerin. 8. Iodine, 3.5 per cent in alcohol.

TECHNIC

Each one of the antiseptic solutions just mentioned was tested directly on the surface of the moist oral mucous membrane of ten different persons, with the exception of antiseptic 8, which was tested six times, and antiseptic 4, which was tested only four times. In other words, the experiments were carried out on a total number of seventy persons.

Each subject was handled as follows: With the head tilted back and resting comfortably on a dental chair (Fig. 1), a sterile cotton roll, 1½ inches long, was inserted over the superior bicuspid and anterior molar region of both sides of the upper maxilla. This cotton roll had a twofold purpose: first, it served as a dam against the outflow from Stenson's duct, and, second, it prevented contact of the mucosa and teeth about the angles of the mouth and the

possibility of seepage into the area under study. After the patient was secured in this position, a moist sterile swab was brought in contact with the moist mucosa situated in the underside of the upper lip. This location was chosen because of its accessibility and ease of control. The swab thus used was rubbed gently over the surface of a blood-agar plate (nutrient agar P_H 7.6 and 5 per cent horse blood). This plate was designated as the control culture. Immediately following this, the antiseptic solution under study was applied generously over the whole area from bicuspid to bicuspid, the exterior surface of the lower border of the lip, the gingiva and the teeth being included in such painting. The area under test was then considered as consisting of three parts (Fig. 1-*A*), namely, left, center and right. After the germicide had been allowed to act for one full minute, a sterile swab, previously dipped in physiologic sodium chloride solution, was rubbed somewhat forcefully against the left mucous area and immediately rubbed onto the surface of a blood-agar plate.

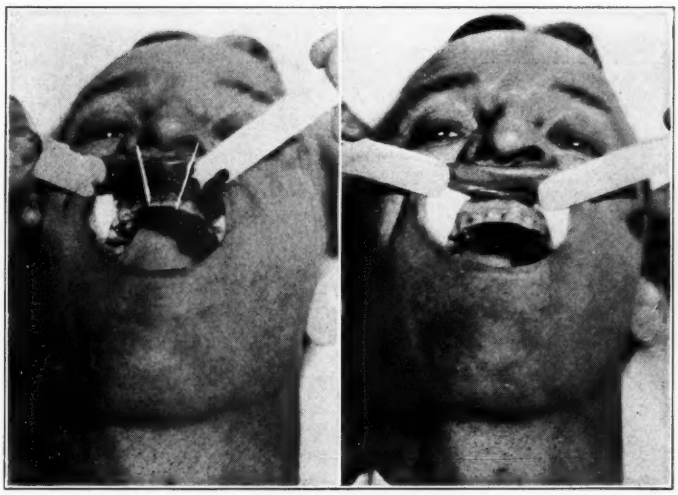

Fig. 1.—At right, sterile rolls in position and patient ready to undergo test; at left, after application of disinfectant, showing trisection of area for one-, three- and five-minute contact periods.

This culture was designated as the one-minute culture. The swab was then inserted into a 250 c.c. flask of broth (infusion broth P_H 7.6 plus 1 per cent dextrose). Exactly the same procedure was carried out at the end of three minutes and at the end of five minutes by obtaining the inoculum from the exact center in the case of the three-minute culture and from the extreme right in the case of the five-minute plate culture. The plate cultures were marked accordingly for future identification. As in the case of the one-minute plate culture, each swab was finally inserted into corresponding broth flasks with the idea of determining any possible bacteriostatic action of the antiseptics.

Observations were made at the end of twenty-four and forty-eight hours in the case of the blood-agar cultures and as long as seventy-two hours afterward in the case of the flasks serving as bacteriostatic controls.

By means of smears stained by Gram's method, a more or less rough qualitative estimate was made of the inhibition, destruction or preponderance of the bacteria present on all cultures.

RESULTS

Table I indicates the comparative results obtained after twenty-four and forty-eight hours' observation of the blood-agar cultures. Bacterial growth is recorded by the usual arbitrary (+) plus signs. Taking the number of colonies on the control plate culture, that is, before treatment of the patient with the antiseptic in question, as a four (++++) plus bacterial growth, the reduction in the number of bacterial colonies due to the germicidal action of the solution used was designated as three, two or one plus, as the case might be, on a rought percentage basis. One (+) plus indicates bacterial growth of anywhere from one to fifty colonies.

TABLE I

ORAL MUCOSA DISINFECTION: COMPARATIVE TESTS

	Mercurochrome 2% Aqueous				Mercurochrome 5% in Alcohol				Mercurochrome 2% in Alcohol-Acetone			
	Control	1	3	5	Control	1	3	5	Control	1	3	5
1.	++++	+++*	+++*	++++*	++++	++*	++*	+*	++++	++*	++*	+*
2.	++++	+++*	+++*	++*	++++	+++*	0	0	++++	+*	+*	+*
3.	++++	+++*	++*	++*	++++	0	+*	0	++++	+*	0	0
4.	++++	+++*	+++*	+++*	++++	++*	+*	+*	++++	++*	++*	+*
5.	++++	+++*	+++*	++*	++++	+*	0	+*	++++	++*	+*	0
6.	++++	+++*	+++*	+++*	++++	0	+*	0	++++	++*	+*	+*
7.	++++	+++*	+++*	+++*	++++	+*	0	0	++++	++*	+*	0
8.	++++	++*	++*	+++*	++++	++*	+*	+*	++++	+*	+*	0
9.	++++	+++*	+++*	+++*	++++	+*	+*	+*	++++	++*	+*	++*
10.	++++	+++*	+++*	+++*	++++	+*	+*	+*	++++	++*	+*	+*

	Iodine-Glycerin 3.5%				Iodine-Glycerin 1.75%				Iodine-Alcohol 3.5%			
	Control	1	3	5	Control	1	3	5	Control	1	3	5
1.	++++	0	0	0	++++	0	0	0	++++	0	0	0
2.	++++	0	0	0	++++	0*	0	0	++++	0	0	0
3.	++++	0*	0	0	++++	0	0	0	++++	0	0	0
4.	++++	0	0	0	++++	0	0	0	++++	0	0	0
5.	++++	0	0	0	++++	0*	0	0	++++	0	0	0
6.	++++	0	0	0	++++	0	0	0	++++	0	0	0
7.	++++	0	0	0	++++	0	0	0	++++	0	0	0
8.	++++	0	0	0	++++	0	0	0	++++	0	0	0
9.	++++	0	0	0	++++	0*	0	0	++++	0	0*	0*
10.	++++	0	0	0	++++	0*	0	0	++++	0	0	0

*Asterisks indicate bacterial growth in the bacteriostatic controls.

Mercurochrome 2 Per Cent Aqueous.—The observations recorded after the application of this solution to the oral mucosa disclosed a lack of germicidal action in all the cultures taken from the ten persons in whom this group of tests was made (Fig. 2). There was, however, a decided drop in the number of colonies after three and five minutes' action of the antiseptic on the oral mucous membrane, as compared with the control cultures. This drop in colony count averaged 25 per cent of the total of tests in this particular group, although as much as a 50 per cent reduction was recorded in three cases. From a qualitative bactericidal standpoint, this mercurochrome solution had a marked germicidal action against the gram-negative cocci of the oral flora,

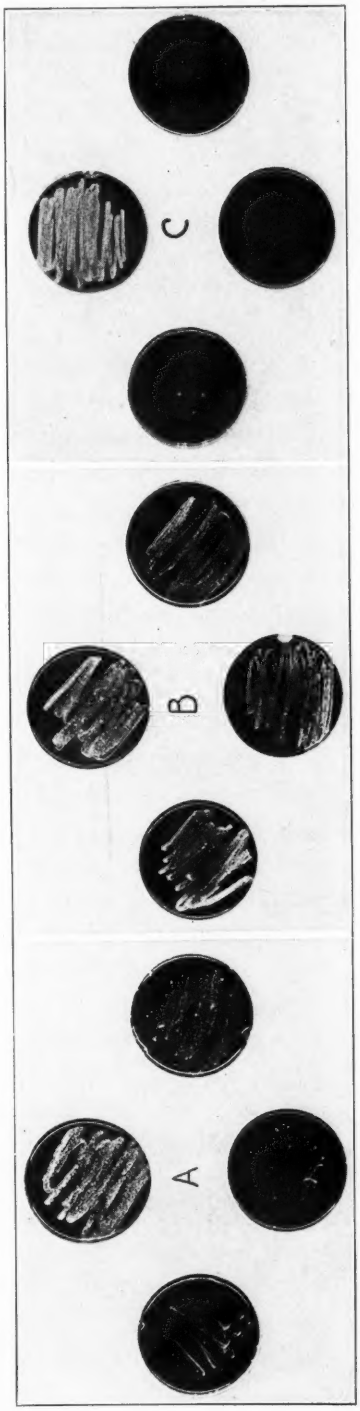

Fig. 2.—Mucous membrane disinfection: *A*, mercurochrome 2 per cent alcohol-acetone; *B*, mercurochrome 2 per cent aqueous; *C*, iodine 3.5 per cent.

slight action against the gram-positive bacilli and practically no action against the gram-positive cocci, particularly the nonhemolytic streptococci. In fact, *Streptococcus viridans* grew luxuriantly in all the cultures from the persons treated with this solution. In a total of ten control cultures and thirty test cultures taken from a group of ten persons, sterility was not secured in any instance of attempted oral mucous membrane disinfection by the use of a 2 per

cent aqueous mercurochrome solution. Each one of the bacteriostatic control cultures (flasks of broth) showed bacterial growth at the end of seventy-two hours' incubation.

Five Per Cent Mercurochrome Solution in 50 Per Cent Alcohol.—This antiseptic showed greater disinfecting action on the mucous membrane of the mouth than the 2 per cent aqueous solution. The data obtained from the one-minute and the three-minute cultures on blood-agar were so lacking in uniformity of bactericidal action as to preclude the formation of definite conclusions as to its power of antisepsis in short periods of time. However, the majority of the one-minute and the three-minute cultures showed a reduction of colonies of 75+ per cent and sterility in only five of the cultures of these time periods, namely, two in the one-minute series and three in the three-minute series. The total number of sterile cultures at the end of the five-minute periods was four. In only two instances (Cases 2 and 7) was uniformity of germicidal action observed.

The action of this solution against the gram-positive cocci was moderate but more effective than the plain 2 per cent aqueous solution. It showed marked bactericidal action against the gram-negative cocci and the gram-positive bacilli. In two cases gram-negative bacilli were observed in the control blood-agar cultures and complete inhibition of the same organism in the corresponding test cultures.

To summarize, in a group of ten persons this antiseptic, used as an oral mucosa disinfectant, caused sterility in four cases, after five-minute intervals, and failed to effect disinfection in six cases.

Two Per Cent Mercurochrome in Alcohol-Acetone.—This solution, as an oral mucous membrane disinfectant, had a sterilizing effectiveness somewhat comparable to that of the 5 per cent mercurochrome alcoholic solution already mentioned. It showed feebler antisepsis in the one-minute and the three-minute periods, but the same number of failures in the five-minute cultures.

The selective bactericidal action was practically the same as that of the 5 per cent alcoholic preparation. It destroyed the gram-positive cocci (*Staphylococcus albus*) and was more active than the aqueous solution against the nonhemolytic streptococci. It prevented the growth of the gram-negative cocci and bacilli in seven cases.

This antiseptic, however, failed to act as an effective mucous membrane disinfectant in four persons out of a group of ten after intervals of five minutes of direct action. The total number of tests, including all time periods, was thirty, of which twenty-five tests failed to produce sterility. The broth flasks showed growth or sterility in uniformity with the results observed in the blood-agar cultures.

Iodine-Glycerin 3.5 Per Cent.—This iodine solution produced complete antisepsis in each one of the thirty blood-agar test cultures (Fig. 2). This group of cultures was obtained from ten persons in whom the antiseptic was tested, as in other instances, for periods of one, three and five minutes' contact with the oral mucosa in each case. In one case (patient 3), bacterial growth was observed in one of the broth cultures acting as bacteriostatic controls, namely, the one-minute interval. However, in view of the absolute germicidal

action exhibited by this iodine solution in all the blood-agar cultures, and of the fact that this apparent impotence of the antiseptic occurred in only one of the one-minute intervals in a total of thirty tests, it would be unwise to interpret just what really occurred in this instance.

In brief, the 3.5 iodine-glycerin solution used in this experiment caused complete disinfection of the surface of the oral mucous membrane in a total of thirty tests on blood-agar plates after one-, three- and five-minute periods of contact of the antiseptic with the oral mucosa. It failed to produce sterility in only one of the thirty control broth cultures, namely, a one-minute culture.

Iodine 3.5 Per Cent in Alcohol.—This solution acted potently in the surface disinfection of the oral mucous membrane. Sterility was secured in every one of the thirty tests comprising the one-, three- and five-minute periods on blood-agar cultures. As in the previous case, the bacteriostatic control flasks of broth showed bacterial growth in two instances out of a total of thirty cultures. This happened in the three-minute and the five-minute broth control cultures in Case 9. The bacterial growth therein obtained was more or less typical of the normal mouth flora.

Iodine-Glycerin 1.75 Per Cent.—As in the preceding experiment, a total of thirty tests was carried out on ten persons, each person being subjected to three swabbings at intervals of one, three and five minutes. No bacterial growth occurred on any of the blood-agar cultures at the end of forty-eight hours' observation. The bacteriostatic control cultures in broth showed growth in four of the one-minute broth flasks (Cases 2, 5, 9 and 10). However, the twenty-six remaining flasks which comprised all the five-minute and the three-minute controls, and also the remaining one-minute tests, remained sterile. It may be concluded, then, that iodine in this strength is a very potent germicide of the surface mucous membrane of the mouth.

TABLE II

COMPARATIVE DISINFECTANT QUALITIES OF IODINE-GLYCERIN AND ALCOHOL-ACETONE SOLUTIONS

	Iodine-Glycerin 0.875%					Alcohol-Acetone			
	Control	1	3	5		Control	1	3	5
1.	++++	++	+	+	1.	++++	++	+	+
2.	++++	+	0	0	2.	++++	+	+	+
3.	++++	++	+	+	3.	++++	+++	+	+
4.	++++	0	+	0	4.	++++	++	++	0
5.	++++	++	+	+					
6.	++++	++	+	+					

Further light on this question of surface sterilization of the oral mucous membrane was sought by testing an alcohol-acetone solution and a further dilution of iodine in ten other persons. The result of these two tests is shown in Table II.

Iodine at this extremely low dilution begins to lose its potency as a germicide of the oral mucosa, as may be observed from the table. Of the eighteen tests performed at the various time intervals, only four resulted in sterility. There occurred, however, a very marked reduction of colonies in all the cultures.

The alcohol-acetone preparation formed a very irritating solution, causing marked discomfort in every person on whom it was tested. The causation of deep excoriations of the mucosa rendered any further testing impossible. The data obtained demonstrated, in a way, that its action as a germicide was very feeble.

COMMENT

The seventy persons subjected to these experiments were handled and treated under exactly the conditions that obtain in actual practice. The experiment was based on a study of swabs from the normal, unbroken mucous membrane of the mouth before and after the application of the antiseptics in question, for certain definite periods of time, namely, from one to five minutes. No tests were undertaken after five minutes' time, because of the belief that a period longer than this is considered impracticable for routine disinfection

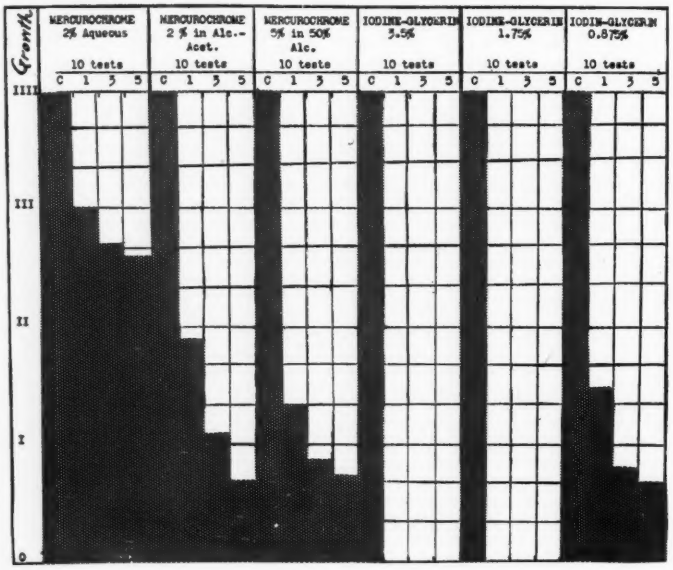

Fig. 3.—Relative bactericidal action of the solutions used.

under average conditions. The study represents a total of seventy control cultures and 210 actual test cultures on blood agar and a corresponding number of bacteriostatic control cultures by means of flasks of medium, each containing 250 c.c. of broth.

Such a bacteriostatic check-up was considered essential because of the unavoidable transfer of large amounts of the antiseptic onto the surface of the blood-agar cultures by each swabbing. Therefore, in order not to confuse a transient bacterial inhibition (caused by an intimate contact of large portions of the antiseptic with the inoculum) with actual germicidal action, dilution of the contents of the swab with the generous amount of fluid culture contained in these flasks made such conclusions impossible.

Tincture of iodine, U. S. P., is seldom, if ever, used at the present time for purposes of oral mucous membrane disinfection. In such strength it acts as a powerful irritant and in susceptible persons may produce local effects of a serious nature. The 3.5 per cent alcoholic solution, although possessing an

effective bactericidal action, is not easily tolerated by the oral mucosa, a certain amount of discomfort and a more or less transient irritation following its use. The combination of iodine with glycerin, that is, glycerin being used as the diluent of the standard tincture instead of alcohol, results in a preparation easily tolerated and devoid of any irritating effects. In fact, under the name of iodoglycerol a solution like this has been used for many years in dental practice. Moreover, the hygroscopic action of glycerin and its probable rôle in affecting surface tension doubtless contribute to render the iodine element of the solution more effective as a germicide. This is possibly what occurred in the 1.75 per cent iodine-glycerin series of tests in which, in spite of a large reduction of the iodine content, effective surface antisepsis was observed. It is probable, in view of the results obtained by the use of a dilution as low as 0.875 per cent of iodine, that the 1.75 per cent dilution is the lowest limit at which this drug may be used, safely, in disinfection of the oral mucosa.

Even in the low dilutions (3.5 and 1.75 per cent), iodine exhibited a moderate irritating action in these tissues. The use of glycerin as a diluent renders this undesirable effect practically nil. Nevertheless, a few of the persons tested exhibited a marked susceptibility to irritation, even with these low dilutions.

The outstanding and important question involved in these tests is that, of all the antiseptic solutions compared in this experiment, iodine solutions are the most effective germicide in the presence of the organic elements constantly present on the surface of the mucous membrane of the mouth. Particles of food, mucus, saliva and cellular débris are known to affect greatly the action of disinfectants of the mouth.

A final analysis of these tests shows that mercurochrome-220 soluble (2 per cent aqueous) possesses a very feeble antiseptic action on the surface disinfection of the oral mucous membrane; in fact, sterility was not secured in any of the three time periods at which it was tested. The 5 per cent mercurochrome solution in alcohol and the mercurochrome-alcohol-acetone preparation possess a decided advantage over the aqueous solution. However, from the standpoint of disinfection of the oral mucous membrane, the germicidal actions of these two suggested improvements of mercurochrome, in skin disinfection, lags far behind the apparent antiseptic effectiveness of the tincture of iodine solutions employed.

CONCLUSIONS

1. Mercurochrome-220 soluble (2 per cent aqueous solution) is too feeble an antiseptic to be used safely as a surface disinfectant of the oral mucous membranes.

2. The 5 per cent mercurochrome solution in alcohol and the mercurochrome-alcohol-acetone preparations possess decided advantages over the aqueous solution, but fail in too large a proportion of cases to be considered effective in surface disinfection of the oral mucous membrane.

3. Iodine in dilutions of 3.5 per cent, and even in 1.75 per cent strength, preferably in glycerin, is an effective germicide from the standpoint of surface disinfection of the oral mucous membranes.

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DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., F.A.C.D.,
and Howard R. Raper, D.D.S., F.A.C.D.

THE RADIOGRAPHIC LOCALIZATION OF UNERUPTED TEETH

By Dr. Clarence O. Simpson, St. Louis, Mo.

IN A LETTER of inquiry recently received, the correspondent submits his problem in the following statements: "In my practice of radiodontia a question has arisen which puzzles me and the orthodontist who referred the patients. The enclosed radiographs show impacted cuspids apparently situated lingually. Subsequent surgical procedures, however, located them buccally. What is the explanation? Furthermore, what is your technic for this type of work (vertical radiographs) that an impacted upper cuspid or bicuspid may be definitely located? In other words, how may the upper teeth be represented in a radiograph as a series of buttons, which I believe would locate such teeth? How can this be done in spite of the dense bone structures which may be penetrated?

Fig. 1.—The view which misled the correspondent in locating the unerupted tooth. A large film in the occlusal plane, and the rays directed downward and backward through the nose offers little advantage over the ordinary lingual views for localization.

"The orthodontist said to tell you that unless you could help us do this, you need not feel qualified to write any more books on radiography. Seriously,

we are anxiously awaiting word from you, and assuredly will appreciate any help that you may render us. To tell the truth, since I have tried so diligently with both medical and dental machines, with both slow and fast films, with all manner of exposure and angulation without success, it has me defeated."

This method of localization was presented by me before the American Society of Orthodontists in 1919. In connection with this occasion, it is recalled that Dr. B. W. Weinberger said, "Do not be disappointed if they do not appreciate that technic now, considerable time will be required to realize the value of the method." During the intervening years the technic

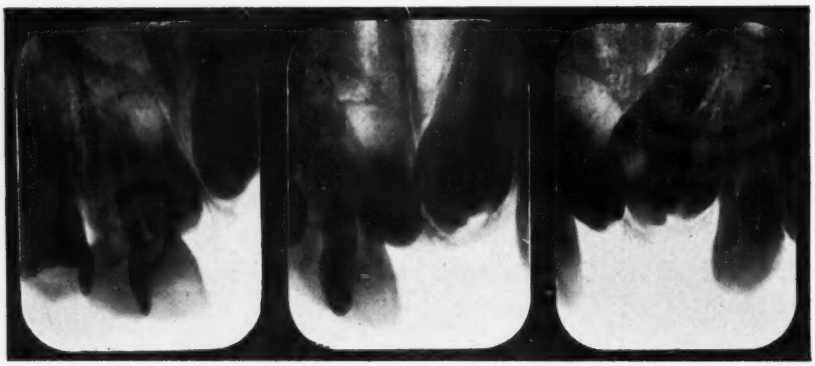

Fig. 2.—Three lingual views of unerupted teeth. The mesiodistal and superoinferior relations of the teeth are revealed but there is little information regarding the labiolingual relation. Also the number of unerupted teeth is not clearly shown.

Fig. 3.—A view of the same teeth as in Fig. 2 with the film in the occlusal plane, and the rays directed through the nose. It will be observed that there is little difference in the relation of the images, and the number of unerupted teeth is no more clearly shown.

has been repeatedly described and demonstrated, but is not yet generally used. This illustrates how long it takes to establish an evidently practical system, and how younger men entering the profession must grope for the technical refinements which have not been included in their professional training. Men laboriously strive for methods to solve their clinical problems, when study of textbooks would readily provide the solution. Innumerable things are rediscovered and exploited, which have long been used or discarded by experienced practitioners.

Fig. 1 is a reproduction of the view from which the correspondent incorrectly located the unerupted tooth on the lingual side of the process.

This view was obtained by placing the film packet in the occlusal plane, and directing the rays downward and backward through the nasion. It is a common mistake to believe that merely placing the film packet in the occlusal plane is sufficient for localization. When the angle of projection with the film packet in occlusal plane produces images which are approximately the length of the teeth, there is only about 25 degrees difference in the view from that of the ordinary lingual view. This makes but little change in the relation of the images of erupted and unerupted teeth unless they are widely separated, and any attempt at localization must be made by deduction from the principle that the object farther from the tube apparently moves in the same direction as the tube is moved for different exposures.

To determine with precision the labiolingual relation of unerupted teeth to the erupted teeth, the rays must be directed parallel with the longitudinal axis of the erupted teeth. The descriptive term, occlusal view, implies a

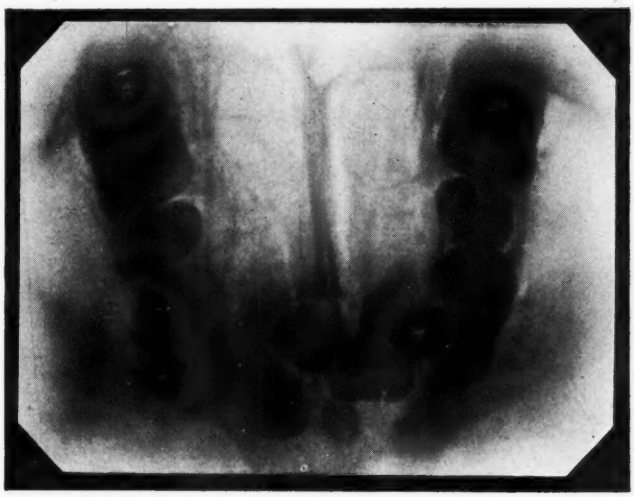

Fig. 4.—An occlusal view of the teeth shown in Figs. 2 and 3. The labiolingual location and the number of the unerupted teeth is evident.

view through the occlusal surfaces, or incisal edges and paralleling the longitudinal axes of the teeth. The radiographic image obtained by this method renders deduction or calculation with a considerable factor of error unnecessary, because the labiolingual relationship of the teeth can be visualized and measured. With the occlusal view revealing the labiolingual relation, and the ordinary lingual views showing the mesiodistal and superoinferior relation, the relative location of unerupted teeth to the erupted teeth is disclosed. An unerupted tooth, root fragment, or foreign object can be localized in an edentulous region by puncturing, and inserting in the gums over the suspected region, a small piece of gutta-percha. Then by obtaining occlusal and lingual views the relative location of the concealed tooth or object and the gutta-percha marker can be determined with accuracy.

The technic for the occlusal view examination is comparatively simple, but the angle of projection must closely conform to the longitudinal axes of the teeth for exact localization. To easily attain this requirement the angle

of projection should be established before placement of the film packet. After the packet is in position it is likely to be displaced by examination of the teeth, the view of the teeth is obstructed, and the avoidable delay increases the discomfort of the patient.

For examination of maxillary regions, the angle of projection is indicated by the calibrations on the tube stand, since the occlusal plane in which the film packet is located may be placed horizontal. However, in reclining the head for examination of mandibular regions, the inclination of the occlusal plane varies with the individual flexibility of the neck. With this indefinite position of the occlusal plane, the angle of projection can be established with other anatomic landmarks. To do this, the longitudinal axes of the teeth in the region to be examined should be closely observed, and landmarks noted on the face through which the central rays should pass when the teeth are occluded on the film packet.

In the maxillae because of the usual labial and buccal version of the teeth, the divergent rays will approximately parallel the longitudinal axes of most of the teeth. Due to this desirable conformity, an adaptable occlusal

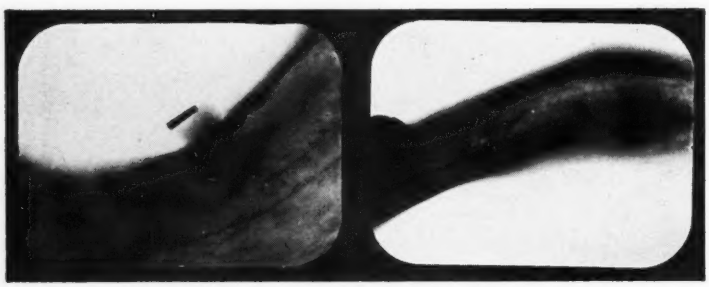

Fig. 5.—An illustration of a root fragment in an edentulous region localized by the relation of a gutta-percha marker inserted in the gums as shown in lingual and occlusal views.

view may be obtained of the entire maxillary arch with the angle of projection ten degrees posteriorly from vertical. However, for accurate localization, the rays should parallel the longitudinal axis of the tooth which is to be the basis for calculation. For example, in localizing an unerupted third molar, the rays should parallel the second molar, and for an unerupted tooth in the incisor region should parallel an adjacent incisor.

In mandibular regions where anatomic landmarks should be selected as a projection guide, the average direction of the central rays for the second molar region is through the tooth and the inner corner of the opposite eye, and for the incisor region is through the teeth and some location on the nose. The marked difference in the labiolingual position of the mandibular incisors requires careful calculation in directing the rays for each patient. The small size of the teeth in comparison to the thickness of the mandible in this region is a probable source of error. It is unlikely that the tube will be placed too far under the chin, but there usually is difficulty in getting far enough. When the rays do not parallel the longitudinal axes of the incisors, an unerupted tooth located on the labial side is projected on the roots of incisors and may appear as a lingual displacement. The test for

accuracy in occlusal views is the cross-section image of the teeth with the roots being superimposed upon, instead of projecting beyond the crown. The only exception to this rule is the maxillary first molar where the divergence of the roots is too great for the crown to cover the entire lingual root. With attention to angles of projection, occlusal views are easily obtained and the use of this effective localization method should not be neglected.

University Club Building.

ABSTRACT OF
CURRENT LITERATURE

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA
DENTAL RADIOGRAPHY
By Dr. Edward Preble, New York City

NUTRITION AND PEDIATRICS
By Dr. Samuel Adams Cohen, New York City

It is the purpose of this Journal to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Nutrition and Pediatrics

The Vitamines of Commercially Concentrated Orange Juice. Stanley Gordon Willimot. The Biochemical Journal **22**: 535, 1928.

Willimot from experiments at the Biochemical Laboratory, Cambridge, concludes that there is hardly any loss in the vitamine A and vitamine B contents of the juice of fresh ripe California oranges after they survive the industrial process of concentration by the method of vacuum distillation at 37° C.

The author quotes the conclusions of Goss in 1925, which were confirmed by other investigators, that the content of vitamine C was also practically unchanged by this same method of concentration.

Willimot further states that such a concentrate is sterile and agrees with the findings of other workers that the concentrate keeps well over long periods.

Vitamine Requirements of Nursing Young. Barnett Sure. Journal of Nutrition **1**: November, 1928.

In his experiments on rats in carrying out the determinations of vitamine requirements of nursing young, Sure raises the question, "Do infants, breast or artificially fed, receive adequate amounts of vitamine B?" Among others, the writer mentions the work of Macy, Outhouse, Graham and Long, all of whom demonstrated that pooled human breast milk taken from individuals subsisting on the average American diet is markedly deficient in vitamine B. These investigators also suggest that every infant, whether breast or artificially fed, should have some supplementary vitamine B product added to its diet.

In his own investigations Sure noticed that during the various stages of vitamine B deficiency the following pathologic symptoms have been noted: (a) gastric stasis; (b) paralysis of the pharynx and muscles attached to the jaw, so that the nursing young are unable to swallow readily; (c) muscular tremors and convulsions; (d) hemorrhages in the bones and viscera.

In view of his findings the author feels that vitamine B should be added to the infant's diet both for its prophylactic and for its curative effects. As a matter of fact he states that the nursing young need approximately 100 times as much vitamine B (calculated in terms of hydrated baker's yeast) as vitamines A and D for continuous growth during the nursing period.

The Effect of Inanition and Vitamine B Deficiency on the Pigeon. Guy Frederick Marrian. Biochemical Journal **23**: 836, 1928.

According to his experiments on pigeons at University College, London, and the Pasteur Institute, Paris, the author found hypertrophy of the adrenals occurs both when vitamine B free diet is given and also when these animals are starved but with vitamine B present in the diet. In the starving pigeons 44 per cent of the total hypertrophy is accounted for by edema; in the vitamine B deficient birds only 19 per cent of the adrenal hypertrophy is edematous.

The author feels that the cortex of the adrenal is mainly affected in vitamine B deficiency. The fact is important since there is experimental evidence (although not wholly accepted by a few) which shows that the adrenal cortex has the function of removing or neutralizing in some manner the various toxins, bacterial or otherwise.

Vitamine D in Adults. Robert E. Havard and John C. Hoyle. Biochemical Journal **22**: 713, 1928.

The authors quote Hess and Lundagen who showed that in summer there is a seasonal increase of the inorganic phosphate in the blood of infants. Likewise Havard and Reay observed in adults that there was an increase of the inorganic phosphate in the summer time as compared with the winter.

The increase of the blood inorganic phosphate naturally pointed to the increased formation of vitamine D by the greater incidence of ultraviolet light in the summer time.

The authors' experiments on adults in the Biochemical and Pharmacological Laboratories, Cambridge, England, cast doubt on this conception. In addition to their regular diet three healthy adults were given the equivalent of more than 50 c.c. of cod liver oil daily in the form of irradiated ergosterol. No change was noted in their blood inorganic phosphate and serum calcium. Similar negative results were noted when two adults were regularly exposed to the rays of a carbon-arc lamp for a period of sixteen days.

Mucosus Organism From Suppurative Lesions of Rat on Diet Deficient in Vitamine A. William L. Bradford. Jour. of Infect. Dis. **43**: Nov., 1928.

Bradford, from his investigation on rats fed with vitamine A deficient diet at the University of Rochester School of Medicine and Dentistry, isolated an encapsulated bacillus of the mucosus group from the suppurated

terminal lesions in the white rat. He feels that this is a secondary invader of the mucosa of the respiratory tract made suitable for its invasion by the dietary deficiency.

The author quotes the laboratory findings of Manville and also of Daniels and his associates, who believe that vitamine A causes such a reduction in cellular activity that it amounts to a deficiency of glandular activity and that this in turn brings about secondary changes, bacterial invasion and death.

Obvious and Obscure Infections of the Central Nervous System. Simon Flexner. Jour. Am. Med. Assn., 91:1, July 7, 1928.

In a very instructive and highly interesting article, Flexner, writing from the Laboratories of the Rockefeller Institute for Medical Research, reviews some of the more recent work on epidemic cerebrospinal meningitis, poliomyelitis and epidemic encephalitis.

The first two, epidemic meningitis and epidemic poliomyelitis, have a long history and under one designation or another can be traced to remote times. But the definite history of epidemic encephalitis is of comparatively recent origin. The first cases of the disease were observed in Europe in 1916 and 1917.

Epidemic meningitis is a man-borne infection because the meningococcus may live on the nasal mucous membrane, and these organisms are not all precisely the same in biologic character. The meningococci, which first became known in 1887, do harm by acting directly on the membranes about the brain and spinal cord and even on the nervous organs themselves. It is not yet certain whether the entrance of the organisms may not be along the direct lymphatic vessels uniting the nasal mucous membrane with the cerebral meninges. The organisms may also enter the cerebrospinal fluid from the blood stream and this may occur only after injuring the choroid plexus gateway. Epidemic meningitis therefore is an obvious infection of the central nervous system in which the meningococci can be rendered visible and cultivated outside of the body and employed for inoculating animals, in which an experimental disease is produced to a wider and more complete knowledge of the disease in human beings and of its control.

But in regard to poliomyelitis, however, it was not until 1907 that the final proof of its infectious nature was established by its transmission of the human disease to the monkey. The agent producing experimental poliomyelitis belongs to the filter-passing class of microorganisms and besides man only the monkey, as far as discovered, is subject to infection with this filter-passing virus. As a result of repeated experiments and observations, Flexner is of the opinion that poliomyelitis is one of that class of communicable disease in which the infection microbe passes from person to person by way of the secretions of the nose and throat, and that in susceptible individuals the passage continues from the nasal mucous membrane to the organs of the central nervous system, in which multiplication occurs and from which infection and disease result.

In regard to specific treatment, Flexner advocates the early use of *convalescent human serum* (italics ours) introduced to the site of infection through lumbar puncture. This authority is convinced that only by introducing such human convalescent serum directly into the cerebrospinal fluid, thus bringing it into immediate relation with the seat of the disease, can the action of the poliomyelitis virus on these areas in the spinal cord and brain be arrested.

Concerning epidemic encephalitis or lethargic encephalitis the weight of evidence is to the effect that the origin is still undiscovered. Also its causation or etiology is wholly obcure.

Flexner feels that although its pathologic changes are not complex clinically, it is a much more complex disease than either meningitis or poliomyelitis. Cellular infiltrations in tissue and about blood vessels, degeneration of ganglion and supporting cells, and proliferation of glia are the main incidents which blast the future of many of its victims by producing early Parkinson's disease, impairing mental power and perverting the moral character.

A Comparison of Raw, Pasteurized, Evaporated and Dried Milks as Sources of Calcium and Phosphorus for the Human Subject. Max M. Kramer, E. Latske and M. M. Shaw. J. Biol. Chem., September, 1928, xxix, 1.

From the Agricultural Experiment Station these authors conducted an interesting series of metabolism experiments with children and adults as subjects in an effort to learn whether or not the calcium and phosphorus in various forms of milk are equally available for human nutrition. With children it was observed that they retain more calcium when it is supplied in fresh milk than when it is furnished in equal amounts by dried milk. With adults, pasteurized milk gave less favorable calcium balance than did fresh milk. Adults subject to using evaporated milk showed balance at least as good as when fresh milk was used. In general phosphorus balances followed the trend of calcium balance figures.

Effects of Different Food Substances upon Emptying of the Gall Bladder. William F. Krause and Lester R. Whitaker. Am. J. of Physiol., November, 1928, xcvii, 1.

The authors studied the comparative effects of different food substances upon the gall bladder of the cat. They found that fats and fatty acids were by far the most active foods in emptying the gall bladder, while pure carbohydrates were practically ineffective in this respect. Pure proteins in the form of lean meats, peptone, casein, skim milk, albumin, produced slight emptying of the gall bladder.

In their experiments on cats the authors were unable to confirm the conclusion of McMaster and Elman, who stated that psychic stimulation, such as sight of food and smell of food, produce emptying of the gall bladder.

Obituary

Dr. Victor Hugo Jackson

FOLLOWING a brief illness, Dr. Victor Hugo Jackson, Clinical Professor of Orthodontia at New York University, passed away on January 26, 1929.

The New York University College of Dentistry mourns the loss of Dr. Jackson as an esteemed member of the faculty, and one of its outstanding characters. A pioneer in his field, an authority of international recognition, he has given much to orthodontia and the profession at large.

Dr. Jackson was born in Arcade, N. Y. in 1850. He received his dental and medical degrees from the University of Michigan. He began dental practice in New York City in 1879, and soon became deeply interested in the subject of orthodontia. Carrying on exhaustive and persistent studies, he devoted his time to this science as a specialty since 1911.

Dr. Jackson is the author of books on orthodontia and orthopedia of the face. The appliances which he devised and the principles which he practiced became the property of the profession and made his name famous on two continents.

At Buffalo University, where there is dedicated in his name the "Victor Hugo Jackson Clinic of Oral Surgery," he was professor emeritus. He was lecturer of Orthodontia at the Forsythe Dental Infirmary in Boston, and, during recent years was Clinical Professor of Orthodontia at New York University, College of Dentistry.

Dr. Jackson belonged to many scientific, social and civic organizations. He was a member of the district, state and national dental and orthodontic societies. As a friend and teacher he leaves behind a host of admirers. He has been and will continue to be an inspiration to those who carry on his work.

Resolution

WHEREAS, The New York University College of Dentistry has suffered the loss, through death, of its Clinical Professor, Dr. Victor Hugo Jackson; and

WHEREAS, The deceased had been a pioneer in the field of Orthodontia, retaining, through a long and active career, a position of leadership among his fellow workers; and who, to the end, remained an indefatigable worker and educator, maintaining the highest standards of the profession and serving as a source of inspiration to his younger followers; and

WHEREAS, In his demise the dental profession has lost a man who gave unstintingly of the best that was in him for the relief of the suffering and for the uplift of all mankind; therefore be it

RESOLVED, That the New York University College of Dentistry expresses its deep sorrow at the loss of its fellow educator and friend; and be it further

RESOLVED, That these resolutions be recorded in the minutes of the faculty and a copy be conveyed to the family of the deceased as evidence of their sympathy.

For the Faculty: EDWARD M. GRIFFIN
ABRAHAM LEES
EGON NEUSTADT

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EDITORIALS

Dr. Victor Hugo Jackson

THOSE of us who were close friends of Dr. Victor Hugo Jackson realized for a number of months that his work was nearing the end. While he remained in active practice and in his office up until a few hours preceding his death, it was very evident that he did not possess the vitality and energy that formerly accomplished his activities.

He had recently moved into a new office at 57 West 57th Street, New York City, which he had fitted out in the careful and painstaking manner characteristic of all his actions. It was here that he undoubtedly intended to spend his remaining days in the practice of orthodontia. He probably did not know his end was so near, as his last will and testament was written as a sort of memorandum, not properly signed and witnessed.

He had often stated that he intended to leave a considerable amount of his estate to assist in dental education. During the last few months of his life

he had been approached by representatives of various schools who beseeched him to make endowments for their institutions. Dr. Jackson spoke to several of his close friends regarding such schools as they believed were entitled to financial recognition.

His last will and testament, which will probably not be accepted by the court, showed that his intentions were to leave a considerable amount to the University of Buffalo and the University of Michigan. He chose the University of Michigan because it was in this institution that he acquired his education in dentistry and medicine. He had been a lecturer for a number of years in the University of Buffalo and occupied the position of Emeritus Professor of Orthodontia in that University. The Victor Hugo Jackson Clinic of Oral Surgery was dedicated in the University of Buffalo on January 12, 1920.

It was Dr. Jackson's intention to leave his collection of models and casts to the Universities of Michigan and Buffalo. The Administrator of the Estate will probably be allowed to carry out this latter wish, but it is a probability whether the courts will allow the Universities of Michigan and Buffalo to receive the financial aid which Dr. Jackson evidently intended they should receive.

Dr. Jackson was a member of many national organizations. He was a member of the Executive Committee of the National Dental Association from 1898 to 1913. He was a fellow of the American College of Dentists. He was one of the founders of the New York Society of Orthodontists, and an honorary member of the Alumni Association of the Dewey School of Orthodontia.

He belonged to many fraternal organizations outside the dental profession. He was a life member of the New York Zoological Society, and the American Museum of Natural History.

Dr. Jackson was best known for his work on the Jackson Appliance which was perfected about 1887. As a clinician he had few equals. At almost any dental meeting attended by Dr. Jackson, one found no difficulty in locating his place in the hall because of the large and enthusiastic audience that surrounded his exhibits. Many principles of the Jackson removable appliance have been recognized and adopted by many men during the last few years. We refer to the use of the spring force as produced by an auxiliary spring. In fact the entire principle of the Jackson appliance is the utilization of the spring force.

Dr. Jackson was a friend of any man interested in orthodontia, and would give such advice and assistance as was within his power. He had many friends in the dental profession, and he will be missed at meetings, as he attended every meeting of any importance.

He attained a place in the dental profession which few will reach, and he will long be known for his valuable contributions to science.

ORTHODONTIC NEWS AND NOTES

American Society of Orthodontists

The annual meeting of the American Society of Orthodontists will be held in Estes Park, Colorado, from Monday evening July 15 to Friday afternoon July 19, 1929. Hotels: Stanley (headquarters), The Crags, Lewiston and Elkhorn Lodge. All ethical dentists are invited. A registration fee of $10.00 will be charged non-members.

Inter-Relations Committee.—William C. Fisher, New York City, Chairman; Joseph D. Eby, New York; James D. McCoy, Los Angeles; Oren A. Oliver, Nashville; W. W. Woodbury, Halifax, N. S.

Research Committee.—A. LeRoy Johnson, New York City, to serve one year; Frank A. Delabarre, Boston, to serve two years; Milo Hellman, New York City, to serve three years; Harry E. Kelsey, Baltimore, Chairman, to serve four years; Martin Dewey, New York City, to serve five years.

Educational Committee.—B. Frank, San Francisco, Chairman; Lloyd S. Lourie, Chicago; Burt Abell, Toledo; James D. McCoy, Los Angeles; Frank M. Casto, Cleveland; Oren A. Oliver, Nashville; J. Lowe Young, New York City.

For hotel information write Dr. Fred W. Beesley, Republic Building, Denver, Colorado. Regarding transportation, write Dr. Kirman E. Taylor, Mack Bldg., Denver, Colorado.

Albert H. Ketcham, President,
Charles R. Baker, Secretary,
708 Church Street, Evanston, Ill.

Eastern Association of Graduates of the Angle School of Orthodontia

The annual meeting of the Eastern Association of Graduates of the Angle School of Orthodontia will be held at the Vanderbilt Hotel, New York City, on Monday and Tuesday, May 13 and 14, 1929.

An invitation is extended to all interested in orthodontia.—E. Santley Butler, Secretary, 576 Fifth Avenue, New York City.

Ontario Dental Association

The Sixty-Second Convention of the Ontario Dental Association will be held at the King Edward Hotel, Toronto, May 27, 28, 29, and 30, 1929. Members of the American Dental Association and State Societies are cordially invited as guests.

Fred. J. Conboy, Secretary-Treasurer,
East Block, Parliament Bldgs.,
Toronto, Ontario.

Dental Society of the State of New York

Preliminary Program

The Dental Society of the State of New York will hold its sixty-first annual meeting in Rochester, New York, on May 15, 16, 17, 1929.

Literary exercises, clinics, exhibits, etc., will be held at the Columbus Building. Dr. E. G. Link, Cutler Bldg., Rochester, N. Y., is chairman of the Exhibits Committee. Dr. John T. McIntee, Cutler Building, Rochester, N. Y., is chairman of the Clinic Committee.

The Executive Council will convene, for the transaction of the business of the Society, on Tuesday, May 14th at 3 P.M.

Essayists.—Dr. Frederick B. Noyes, Chicago, Illinois; Dr. Chalmer J. Lyons, Ann Arbor, Mich.; Dr. O. G. L. Lewis, Philadelphia, Pa.; Dr. P. C. Lowry, Detroit, Mich.; Dr. T. W. Mavos, Cleveland, Ohio; Dr. James K. Burgess, New York City.

During the time of the meeting, sessions of the New York State Dental Hygienists Association and the Dental Assistants Association will be held.

Headquarters will be at the Hotel Seneca and reservations should be made direct with the hotel management.

For information with reference to the literary exercises, clinics, etc., apply to Dr. A. P. Burkhart, Sec'y, 57 East Genesee St., Auburn, N. Y.

Award of Morris L. Chaim Prize for 1928. By First District Dental Society, State of New York

The Morris L. Chaim Prize for 1928 has been awarded to Dr. Samuel Goldberg, Johannesburg, South Africa, for his paper on "Biometrics of Identical Twins from the Dental Viewpoint."

First District Dental Society of the State of New York

The following resolution presented before the Pathodontia Section, December 17, 1928, was unanimously adopted:

WHEREAS the Officers and Members of the Pathodontia Section, of the First District Dental Society, recognize the importance for the use of the x-ray as an aid in diagnosis, and during the process of treatment of pulpless teeth, and

WHEREAS certain practitioners ignore this procedure, and

WHEREAS such practice is considered contrary to the best interests of the patient, and

BE IT THEREFORE RESOLVED that such procedure will be considered questionable practice in this branch of dentistry, and

BE IT FURTHER RESOLVED that this resolution be entered upon the minutes of this Section, and a copy be forwarded to the professional journals for publication, and also inserted in an early issue of the First District Dental Society bulletin.

Notes of Interest

Dr. J. Lowe Young and Dr. Glenn F. Young announce their association as partners in the practice of orthodontia at 18 West 74th Street, New York City.

Dr. Orosman Lopez and Dr. Manuela Lopez announce the removal of their offices to Calle 17 No. 451, Habana, Cuba. Practice limited to orthodontia.

Dr. Curtis Benight announces that his work is now limited to the practice of orthodontia at 1001 Republic Building, Denver, Colo.

Dr. James T. Walls announces the removal of his office to Suite 802 Medical-Dental Building, Eleventh and Taylor Streets, Portland, Oregon. Practice limited to orthodontia.